THE

NATURALIST:

A

MONTHLY JOURNAL OF

NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY

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RILEY FORTUNE, F.Z.S.

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THE MUSEUMS, HULL;
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THE NATURALIST

For 1915.

NOTES AND COMMENTS.

MR. RILEY FORTUNE, F.Z.S.

This year the selection of the President of the Yorkshire Naturalists' Union rested in the first place with the Zoologists on the Executive Committee of the Union, and on their recommendation the election of Mr. Riley Fortune to that office was unanimous. Mr. Riley Fortune is not chosen as a 'figure-head.' He is one of the Union's workers and is rarely absent on field excursions or at indoor meetings. He has held various offices in the committees under the vertebrate section, and has been president of that section. For some years he has done valuable work as Hon. Secretary of the Wild Birds' and Eggs' Protection Committee. He is Chairman of the Yorkshire Mammals, etc., Committee, and for some years has rendered good service to the Union as Divisional Secretary for the North West Division. He has been a great help to this journal as referee for vertebrate zoology, and his interesting notes are familiar to our readers. His excellent achievements with the camera are well-known, and have enriched the pages of this and other scientific journals. 'The Birds of Yorkshire,' published by the Union a few years ago, contained a very large number of his photographs, which he freely placed at the service of the editors. We can only repeat a toast that we saw on a menu the other day (for even naturalists dine), 'May Fortune always smile on us.'

THE PLUMAGE BILL.

It will be remembered that Yorkshire has always taken a prominent part in connection with the passing of Parliamentary Acts and other measures for the preservation of bird life. In connection with the present Plumage Bill, which was unfortunately shelved in consequence of the war, at a stage in its career when it had every prospect of being passed into law, one of the Secretaries of the Yorkshire Naturalists' Union communicated with each Member of Parliament for Yorkshire asking for his support. This was done at the suggestion of the members of the Vertebrate Section of the Union. A number did not reply to the letter at all, others would carefully consider it, and the following gentlemen definitely promised to support the Bill:—Sir George Scott Robertson, Sir Luke White,

the Rt. Hon. T. R. Ferens, and Messrs. G. Beckett, J. S. Butcher, T. E. Harvey, A. Marshall, A. S. Rowntree, A. Sherwell, J. H. Whitley, and E. Wood.

VAPOURER MOTH ON HEATHER.

Mr. S. Margerison contributes to a recent number of 'Wild Life,' a short illustrated article on insect plagues. He refers to the recent invasion of a Yorkshire grouse moor by a swarm of caterpillars of the Vapourer Moth. A large patch of the moor was 'absolutely stripped of every leaf of ling and bilberry, and every blade of grass.' Such a plague was quite new to the keepers, and there are no recorded observations of an attack upon moorland plants by this species; yet 'the crowd of quickly moving caterpillars was like an advancing army, numbering tens of thousands, and young ones were all the time emerging from the eggs, which had been deposited on silky cocoons fixed to the wiry stems of the vegetation.' Mr. Margerison points out that the Vapourer belongs to the same family as the Nun Moth, which has wrought such havoc in German and Russian forests. In two years alone these moths stripped the leaves of 6,375 acres in the Rothebude Forest, 'their droppings covering the ground to a depth of five to eight centimetres, whilst the sound of their falling was like that of heavy rain.' Large sums of money were spent in vain attempts at extirpation.

THE PAULL MUSEUM, HOLDERNESS.

We take the following from *The Museums Journal*:—'The following characteristic announcement appears in the report of the Hull Museums Committee with reference to the well-known museum at Paull, an out-of-the-way village in Holderness. We understand that the former owner had it valued at something like £3,000, and apparently the Hull Museum has secured what was worth securing for about £3:—"I have to report that on account of the death of Mr. J. D. Battersby, an ex-Hull Town Councillor, his well-known museum at Paull was put up for auction on the 10th and 11th October. As the committee is aware, there was an enormous accumulation of material of various sorts, among which, however, were some objects which certainly ought to be in the Hull Museums. Fortunately, or unfortunately, partly on account of bad weather, and partly on account of the inaccessibility of the village, the attendance was small, and we were able to get practically everything that was of value to us at absurdly low prices; the price of 1s. and 1s. 3d. per lot being not uncommon. We missed a few interesting items, which were secured by Councillor Harrison, but I have since visited his warehouse and he has given us the objects we wanted from his lots.

To give a complete list of the specimens we secured would be much too lengthy, but among them are: a fine massive prehistoric stone hammer from Ottringham; harpoon gun from a Hull whaler; antique pistol made by Carter, Hull; antique brass powder pistol, by Brunton, Doncaster; a fine goblet of turquoise blue glass, made at the Hull Glass Works; two carved oak pew ends (15th century) from Holy Trinity Church Hull; large model of a fishing smack; a massive lantern from the old Hebbles' light, Paull; a fine Georgian mahogany bedstead, with carved top; various ecclesiastical antiquities, and several interesting models, as also a large osteological collection. The remarkable feature of the collection, however, was the number of interesting "bygones" which Mr. Battersby had secured. Practically the whole of these came to us. The total cost to the Corporation for a collection consisting of nearly 200 specimens is about £3 3s."'

THE STORY OF A 'NEW' BIRD.

On May 13th last, two Black-headed Buntings were exhibited at a meeting of the British Ornithologists' Club, and were referred to in the Club's Bulletin No. CXCVIII., pp. 133-4. One had been caught at Halifax, Yorkshire, in December, 1910, and kept alive in an aviary at Hove until May, 1912, when it was killed by a Corn Bunting. The other had been shot at Battle (Sussex) in April, 1912. We referred to the matter in *The Naturalist* at the time, and regretted that our Yorkshire specimen should have been mixed up with a Sussex bird, because rightly or wrongly, northern (and some southern) ornithologists have received with suspicion so many of the new bird records from the south. Our contemporary, *British Birds*, also referred to the record, but without comment.*

A YORKSHIRE RECORD.

The Yorkshire bird had been supplied by a Mr. Hamilton, herbalist, etc., of Halifax. As it was the first county record, Yorkshire ornithologists were anxious to verify it, and asked the Secretary of the Halifax Scientific Society to investigate. He called upon Mr. Hamilton, but that gentleman's mind seemed to be a blank; he knew nothing whatever about it! Later, the Curator of the Museum at Hull wrote to Mr. Hamilton enclosing a catalogue of the birds in the Hull collection, and asking to be informed of any species in Halifax which were not at Hull. Particular mention was made of a Black-headed Bunting, which he had seen from the papers had been supplied to a collector in Sussex.

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* July, 1914, p. 55.

A HALIFAX DEALER.

Mr. Hamilton nibbled. He wrote, 'I could not say how long I might be getting one in the flesh, *having now four on order,* but I have very great facilities for offering rare and ordinary specimens and send to the Elite of Society and such. At the present time I can only supply two Black-headed skins for £1 and eggs 1/- each. I always send to first P.O. or return cash.' Enclosed with his letter was a long list of skins recently supplied 'some in the flesh, also eggs, and can still supply another lot of each.'

A HALIFAX RECORD.

In reply to a question as to the authenticity of the Halifax specimen, (which he had forgotten about when he was called upon), Mr. Hamilton replied, 'The Black-headed Bunting was sent alive and not shot, and certainly not like those I also offer imported.' However, on October 1st, the Curator of the Museum at Hull wrote saying he was not wanting anything but *Yorkshire* birds, so the correspondence ended.

A LITTLE-BUNTING.

However, on October 11th, Mr. Hamilton sent a card:— 'I have for disposal something few possess, viz., Live Little Bunting caught near Ripon, grand condition on seed, lowest price 15/-, now or never. I give you first chance.' He was requested to send the bird on, with an account. But Mr. Hamilton was too old a bird to be caught. He wanted cash with order as he *had bought* the bird from a friend, and could obtain much more by advertising. Further correspondence made it evident that the bird would not be sent before the money was received, as Mr. Hamilton later stated, 'I *have to pay beforehand.*' It was also apparent that for the moment he was short of money, though he volunteered the statement that he had a cheque of £50 to draw in three weeks.

SOLD.

Anyway on October 20th, 15/- was sent for the 'Little Bunting,' which arrived on the 27th, quite chirpy, and has been alive and well ever since in an ordinary canary's cage. Later, a receipt was sent for 15/- for the *Little Bunting.* The bird was shown at a meeting of the Vertebrate section of the Yorkshire Naturalists' Union at Leeds, on November 21st, and, as might have been expected, proves to be no Little Bunting at all! *

* Our Bradford friends are of the opinion that it is the Alario Finch (*Alario alario,* L., the 'Berg Canarie' of South Africa; and if caught wild, is probably new to Europe! We have compared this with the illustration and description in Butler's 'Foreign Finches in Captivity,' and it is certainly this species.

FURTHER INVESTIGATION.

However, it was suggested that the Secretary of the Yorkshire Wild Birds' and Eggs Protection Committee should write to Mr. Hamilton, asking for the name and address of the person who caught the bird at Ripon, in order that proceedings might be taken against him ! In reply, Mr. Hamilton mentions his severe illness (pneumonia, three broken ribs, etc.), refers to the Kaiser and the Creator, and then states that as 'already said to a caller, he had no knowledge of a Black-Headed Bunting, neither have I supplied a Little Bunting from Ripon ' ! !

A MEMORY.

Here, then, we have at last had an opportunity of investigating a case of a new record, seen ' in the flesh ' ; a specimen supplied by a dealer who is probably not too well endowed with this world's goods, and who knows that a ' new record ' for a part of this country is likely to bring him more profit than is a foreign bird, sold as such. From the correspondence before us he has obviously a very bad memory (possibly through no fault of his own). As we heard he had been consulting bird lists at the local public library it was evident he was anxious to know what was ' rare ' and what was not.

VALUE OF RECORDS.

But is it fair to the science of ornithology to base new records on the evidence of a dealer with such a bad memory ? And if one has been proved to have had a bad memory, surely it is possible others have also. We do not for a moment suggest that a dealer might be unscrupulous in his search for custom and gain. Some might make such a suggestion ; we don't. We merely say it is unfortunate that in this one case we have been able to investigate, the dealer has had so bad a memory that he states in one letter the very opposite to what he wrote in another only a few days before !

——: o :——

Hen Harriers near Doncaster.—During the present autumn three examples of the Hen Harrier (*Circus cyaneus* L.) have been shot in the neighbourhood of Doncaster. One, an adult female or ' Ringtail ' was obtained on the Brodsworth estate in October. Two others, both also females, have been shot on or near Hatfield Chase. I have not seen these so cannot say whether they are adult or young. I hear from the keeper at Hatfield that he has seen these birds, which he called Kites, off and on for at least a year. If this be so it is just possible that they have bred on the moor, but so far as I know no ' Blue Hawk ' has been seen.—H. H. CORBETT.

BRYOBIA PRATENSIS, GARMAN, AT GRANTHAM, LINCOLNSHIRE.

C. F. GEORGE, M.R.C.S.,
Kirton-in-Lindsey.

THIS mite, when seen alive, is a very beautiful object for the microscope ; it may also be well seen if recently killed or after only a short time in preservative solution. It does not make so striking an appearance, however, when mounted in balsam, in consequence of the transparency produced by that medium, which renders the scale-like projections difficult to make out. N. Banks in his ' Treatise of the Acarina,' gives some very good figures of the mite. He says it is the only species of the genus *Bryobia* in America, and it is the only one I have yet

Bryobia pratensis. × 48.

met with, although it is many years since I first found it. He also says it is very abundant in many localities, and is known as the Clover mite ; in the West, it is injurious to fruit trees ; in the East it more commonly affects clover, and annual plants. Koch figures and describes four species, which are evidently very beautiful mites, but *pratensis* is not one of them.

It appears to have been very plentiful this year at Grantham, in Lincolnshire, where it was found by a lady, who sent me some leaves of ivy covered with them, she describes them as being there in thousands. Mr. Soar's figure gives a good idea of the creature, its special points are the four projecting scale-like processes in front, and on the body of the mite ; one of which, much enlarged, is also shewn. They are opaque white and are beautifully seen in the living mite. The wrinkles on the body are also remarkable. Banks places it in his family *Tetranychidæ*, commonly known as red spiders.

THE THINNFELDIA LEAF-BED OF ROSEBERRY TOPPING.

H. HAMSHAW THOMAS, M.A., F.G.S.,
Fellow of Downing College, Cambridge.

THE locality of Roseberry Topping is well-known to all Yorkshire geologists, and many will have studied personally the fine exposure of Lower Estuarine deposits laid bare by the slip on the north-west side. On one of my early visits to this exposure, I discovered fragments of a thin bed which seemed to be composed very largely of fragments and leaflets of the fronds which are known under the generic name of *Thinnfeldia*. At that time the fall of material from the face above was going on almost continuously, and it was scarcely safe to venture far in quest of more of these specimens, but in the following year, when the ground was becoming settled, I obtained further examples which demonstrated the abundance of these leaves at a certain level in the dark-coloured lower beds lying above the Lias. In the spring of 1913 I set out to try to trace the plant beds from Roseberry Topping across to the main escarpment, known, I believe, as Little Roseberry, and here encountered in a scrape on the hill side, the main portion of the Thinnfeldia leaf-bed, which is undoubtedly one of the most remarkable fossil-plant deposits in Europe. I subsequently excavated this bed, and have made large exposures at two places about a hundred yards apart, and from here the specimens exhibited* were obtained.

We have in these exposures a thickness of 8 to 10 feet of black or dark chocolate shales containing throughout an abundance of leaves which are almost all of the same species. In many places the leaves are so numerous that in a thickness of several inches the bulk of the bed is composed of leaves with comparatively little sediment round them. I have not yet succeeded in determining any definite periodicity in the successive layers, but there are some indications that the leaves were not deposited uniformly. The beds at Little Roseberry seem to rest directly upon the gray shales of the Upper Lias, and seem quite conformable with them so far as can be made out. There is no indication of anything comparable to the ferruginous dogger of Whitby. The massive sandstone which forms such a conspicuous feature in the neighbourhood, is many feet above at this point.

At Roseberry Topping I noted the following sequence at the top of the Lias on the east side of the slip :—

Black Shales with sandy partings ..	8 feet.
Thinnfeldia and other forms at their base	

* These have been kindly presented to the Museum at Hull.—ED.

Grey clay	6 inches.
Black coaly clay	4 inches.

Grey yellow clay passing into Upper Liassic shales.

This gradual passage of the Liassic into the Lower Estuarine is of some interest, more especially when we remember that *Thinnfeldia rhomboidalis* is typically a Liassic plant. I do not think it is possible to say definitely, as the result of examination of the strata, whether the beds which we are discussing should be reckoned as of Liassic or Lower Estuarine Age.

The leaves are compound pinnate structures of various sizes (see fig.), sometimes reaching about a foot in length, but it is seldom that complete leaves are seen or can be extracted owing to their constant overlapping. It may, perhaps, be more correct to speak of them as fronds consisting of a central stalk or rachis some 2-4 millimetres wide, bearing ovoid or lanceolate pinna on either side. The shape of the pinna or leaflets is somewhat varied, depending to some extent on their distance from the apex or the base of the frond, and it varies also in different fronds, but in all cases the apex is bluntly rounded, the base is decurrent on the lower side and truncated on the upper side. In some cases the pinnae are so close together as to overlap one another, but in other specimens they may be 3-4 millimetres apart; towards the base of the frond they appear to be inserted on the upper side of the rachis somewhat as in the fronds of some Cycads and Bennettitaleans. At the lower end, the rachis may extend for 6 centimetres or more below the lowest pinnae, it shows longitudinal ridges, and some transverse wrinkling in the centre. In the centre of each pinnae is a strong midrib which is almost always very conspicuous; the secondary veins are, however, very indistinct, and though they frequently appear plain when the specimens are first collected, they are later almost indistinguishable. There were, however, fine veins given off at an acute angle to the midrib, and forking once or twice on their way to the margin.

At the apex of the frond, the pinnae decrease somewhat irregularly in size and they become confluent, the tip being occupied by a terminal leaflet. Near the apex the distinction between pinnae or leaflets and stalk seems to be lost.

Pinnae are frequently irregularly lobed or possess small notches on their margins. The very great variation in shape suggests that several species of *Thinnfeldia* based almost entirely on small differences in outline ought to be dropped, for *Thinnfeldia rhomboidalis* certainly shows very different forms.*

* A very good review of the state of knowledge of the genus has just been published by Antevs. *K. Svenska. Vet. Akad. Hand.*, Bd. 51, No. 6, 1914.

For the present I wish more especially to draw attention to the beautiful manner in which these leaves are preserved. As will be seen from specimens which have been mounted on paper, the tissue of the original leaf is still fairly strong, and the individual leaves can be readily separated from the matrix and handled almost as easily as dried herbarium specimens. In this respect they differ from almost all other fossil plants, which occur either as impressions on a matrix, or as a coaly layer irremovably attached to the stone, or in exceptional cases impregnated with calcium carbonate or some other

Photo of Leaves of *Thinnfeldia rhomboidalis* detached from rock. Natural size.

mineral substance. But here we have the plant itself, which has undergone comparatively little mineralisation, holding together by the strength of its own original tissues, a true example from the 'Herbarium Diluvianum.'

We may best speak of this kind of preservation as mummification, for neither decay of the tissues nor replacement has gone on, only the gradual alteration of the less resistent substances composing the original leaf. The chief reason why the *Thinnfeldia* leaves have retained their form so perfectly is that they possessed, when alive, a very thick and leathery cuticle, or outer layer to the epidermal cells, and the substance composing

the cuticle resists all decay and alteration almost indefinitely. The cellulose substance composing the middle of the leaves turns gradually, after the lapse of a long period of time, into a dark, brittle, carbonaceous substance, formed by slow oxidisation ; this substance when further changed, becomes like coal.*

In most of our fossil plants from the fine grained mudstones of the Yorkshire Jurassic, a change of the same kind has gone on ; their present condition seems to depend on the original proportion of cuticle to softer tissue, and on the changes in the leaf just before or immediately after preservation. It would seem as though any of the Gymnosperms with their thick cuticles might become mummified, and in fact we get some interesting specimens of *Ptilophyllum* (sometimes called *Williamsonia*) fronds from Cloughton Wyke. In these examples the soft tissues must have shrivelled before being buried, for little but cuticle is left. On the other hand the same type of leaf from Gristhorpe does not appear mummified, because the cuticle is too delicate to hold together the brittle carbonaceous matter which represents the original bulky mesophyll. In the Roseberry Thinnfeldias the cuticle is very thick in comparison with the bulk of the inner carbonaceous matter.

Mummified plants of this type are very infrequent outside Yorkshire. Specimens of the same species as those before us, have been found in a somewhat mummified condition in the Lias near Lyme Regis, and in Sutherland. Some coniferous remains have been discovered in the cretaceous deposits of Greenland, and a few come from the Rhaetic beds of Southern Sweden. Mummified plants are very rare in the Carboniferous rocks, but good examples have been found in species of *Sphenopteris* found in the oil-shales of Scotland, and some specimens of exceptional interest have recently been described by Miss Wills (*Geol. Mag.*, 1914), from the Midlands and North Wales. A few specimens have come down to us from more recent times, and I have seen some from the Tertiary beds near Bournemouth.

The Roseberry examples however, stand out above all others because of the vast numbers of leaves which are to be found there, and we are justified, I believe, in saying that the bed is unique.

The leaves under consideration must be referred to the species *Thinnfeldia rhomboidalis* which was founded by Ettingshausen on specimens from the Lias of Steierdorf in

* An interesting example of this natural oxidation recently came to my notice. I received a sample of wheat from an ancient Egyptian granary between 5,000 and 6,000 years old. Each grain retained perfectly its shape and external markings, but had become converted into a dense black brittle substance, with a relatively high percentage of carbon, and reminding one very much of some of the seeds found at Gristhorpe.

Hungary. Though Dr. Gothan has questioned this determination on the ground of the stomatal structure, it is supported by the shape of the fronds and pinnae, and by the nervation. The species also occurs on the continent, in the Rhaetic of Franconia (Bayreuth), and in France; while it may perhaps be identical with some forms occurring in India and South America. In England the type first became known from specimens found in the Lias at Lyme Regis, but more recently it has been described from the Kimeridgian beds of Sutherlandshire by Prof. Seward. Hitherto the genus has not been definitely recorded from any of the other plant beds in Yorkshire and is certainly entirely absent from all the coast localities. I have seen a single specimen in the collection of Mr. Sewell, of Whitby, which was badly preserved but was probably referable to the genus, it came from one of the inland localities in the neighbourhood of Goathland. While we are probably correct in saying that *Thinnfeldia* is more typical of the Lias than of the Middle Jurassic, we must remember that the Sutherland specimens are of Kimeridge age and that somewhat similar fronds have been described from the Wealden beds under other generic names, such as *Dichopteris*.

We may now turn for a moment to discuss the nature and affinities of these leaves.

As in the case of so many other fossil plants, the leaves of *Thinnfeldia* have always been found in an isolated condition and never connected with any reproductive structures. Under these conditions we have only two things on which to base our conclusions and both of them are somewhat untrustworthy. The first is the form and nervation of the leaf, the second the epidermal structure. Early observers basing their conclusions on the first named character thought, that *Thinnfeldia* was a fern, for the outlines, and the nervation were quite fern-like. Against this view there are two objections (*a*) that no leaf bearing sporangia has ever been found, and in the millions of leaves at Roseberry some at least should be present, and (*b*) that the texture of the leaf, and the cuticle must have been very different from that seen in the ferns of to-day.

This brings us to the study of the cuticle, and for this microscope preparations of the epidermal structures must be made. This is effected by placing part of a pinna in a watch glass or a small porcelain dish, covering it with small crystals of potassium chlorate, and adding a few cubic centimetres of strong nitric acid. The dish is covered up and allowed to stand for a day or two until the leaf fragment has assumed a brown colour; the fragment is then removed, washed in water and placed in a very dilute solution of ammonia, when the brown material soon dissolves away, leaving a clear semi-transparent and very fragile membrane. This consists of the

cuticles of the upper and lower sides of the leaf, and after washing these cuticles should be separated and mounted up on a glass microscope-slide in glycerine or canada balsam in the usual way.

On examination under the microscope we shall see clearly the polygonal outlines of the epidermal cells which were separated by thick straight walls and had a somewhat irregular outline. The cuticle of the upper side is very little thicker than that of the lower side, and is uniform in structure, possessing no stomatal openings. On the lower cuticle however, we may observe small groups of six or seven cells slightly raised above the general level of the surface, and with a gap or small cavity between them. These are the subsidiary cells which surrounded a pit at the bottom of which lay the guard cells of the stomata. The guard cells themselves were but lightly cuticularised, but the slit or stomatal opening between them, can frequently be made out. The stomata were not flush with the surface of the leaf, as seen in modern ferns and in most of the plants around us, but sunken in small pits as seen in the pines, cycads, and in many plants living in localities which are physically or physiologically dry.

When compared with the cuticles of other plants, ancient and modern, we may notice a somewhat similar structure in some of the Carboniferous Pteridosperms, in the *Nilssoniales*-section of the Jurassic cycad-like fronds, in some recent cycads, and some conifers, both of Cretaceous and recent age. The circle of affinities is thus narrowed to the pteridosperms, cycads, or conifers, among the plants with which we are now familiar.

Some time ago Prof. Seward suggested that these leaves might have belonged to the pteridosperms, a class of plants intermediate between the ferns and cycads. The general form and insertion of the pinnae favours to some extent the cycad view, while a comparison between *Thinnfeldia* and the curious New Zealand conifer *Phyllocladus* has been made by some, including Mr. Antevs, a Swedish palæobotanist, who has just published an excellent revision of the genus. The question cannot yet be settled, but let us see whether additional evidence can be obtained from the study of the remains in the Roseberry bed, for here we have a much larger and more complete supply of material than has ever previously been obtained. The first point which is noticeble is the vast number of *Thinnfeldia* leaves which go to form this bed, and secondly that throughout a thickness of several feet practically no other leaves are seen; we do meet with an occasional *Nilssonia* but they are few and far between. We may conclude from this that the *Thinnfeldia* plants formed an almost pure association somewhere in the immediate neighbourhood, and that they produced a great number of leaves. Now the cycadean plants

which we know, are almost all slow growing plants with few leaves, and these persist for several years, and I find it impossible to concieve of a leaf-bed like ours being formed from cycadean plants of any known type.

It is also possible that the *Thinnfeldia* plants were deciduous, for there are few branches or stems to be found in our bed, and trees with persistent leaves more readily lose twigs and branches during storms.

But the principal conclusion which I draw from inspection of the bed, is that the plants on which these leaves grew were probably trees, on no other hypothesis can we explain the accumulation of such vast numbers of leaves, at what must have been a very rapid rate. Had the supply been small and the rate of deposition slow, a certain amount of decay must have gone on in the leaves before preservation, but this was not the case. These considerations may perhaps favour the coniferous view.

Beyond this I cannot go at the present time, but I may mention that I have recently made two discoveries which may further elucidate matters when they have been fully studied. After prolonged search for reproductive organs I have found a small number of seed-like bodies about 5 millimetres in diameter, which may have been the seeds of *Thinnfeldia*. Also I have found some portions of charcoal-like wood, which may provide some additional evidence. Although I cannot now announce any startling discoveries, I trust that it has been worth drawing attention to this leaf-bed, and the specimens obtained from it.

——:o:——

Mechanical Properties of Wood. By **S. J. Record.** London: Chapman and Hall, 1914, pp. 6+165, 7s. 6d. net. In the introductory chapters of this work the author deals with commendable clearness with the mechanical principals involved in timber testing. He keeps always in mind the fact that those interested in wood have rarely a knowledge of higher mathematics, and shows how successfully a clear idea of the main facts can be obtained by the use of simple and intelligible language. The numerous factors affecting the strength of timber are considered briefly but in an interesting manner, and on the obscure question of the effect of habitat on the quality of timber he says that some woods, e.g., long leaf pine, appear uninfluenced by habitat, while others, like the short leaf pine and loblolly show marked differences according to habitat, also that certain woods, e.g., hickory, from limestone soils are superior to those from sandy soils. The general conclusion, however, is that all locallies have their heavy and light timber, so they all share in strong and weak, hard and soft materials, and the difference in quality of material is evidently far more a matter of individual variation than of soil and climate. The concluding section deals with testing and testing machines and is illustrated by numerous photographs and clear and helpful diagrams and sections. There is a long bibliography chiefly of American papers. A fault common to American works is the almost exclusive use of popular plant names; if to these the scientific names were added the value of the works would be enhanced for a wider circle of readers.

YORKSHIRE NATURALISTS AT LEEDS.

THE members of the Yorkshire Naturalists' Union have evidently taken well to heart the new British motto, 'Business as Usual,' for the attendance at the fifty-third Annual Meeting, which was held at the Leeds University on Saturday, the 5th December last, was magnificent indeed, in fact, constituting a record. It was an honour to the Union to be invited to hold their gathering at the Leeds University, the splendid facilities available tending much towards making the meeting so great a success, further enhanced by the efforts of the Committee from the inviting local Societies, ably carried out by Prof. W. Garstang, M.A., D.Sc., and Mr. C. H. Grant, M.Sc.

In the morning a number of members were guided by Mr. Albert Gilligan, B.Sc., F.G.S., up the Meanwood Valley as far as Adel. Mr. Gilligan ably explained the various geological features of the valley, fully set out by him in the circular, to which he has paid special attention. The botanists also found much of interest, but unfortunately the weather conditions were a serious drawback, five distinct types of weather being experienced, of which wind and hail were the dominant !

The Sectional meetings were of brief duration, inasmuch as most sections had already held their meeting prior to the gathering, for the election of their officers and other business. The members of the Permanent General Committee, with delegates from affiliated Societies, of whom thirty-one sent representatives out of the thirty-nine affiliated to the Union, numbering considerably over one hundred, assembled in the new Education Lecture Theatre, when the Annual Report for 1914, and Excursion Programme for 1915, were adopted. The acceptance by Mr. Riley Fortune, F.Z.S., of Harrogate, as President for 1915, was most heartily received.

The applause was great when the Treasurer of the Union (Mr. Edwin Hawkesworth) announced that the balance of the debt which had so long been an incubus upon the progressive work of the Union had been entirely wiped out, and that the substantial balance of £40 6s. in actual cash was now in hand, and that in addition the Hey legacy of £20 was also intact.

The Lecture Theatre was crowded at the evening meeting. The retiring President, Mr. Thomas Sheppard, F.G.S., F.S.A. (Scot.), occupied the chair, and was supported by Dr. Michael E. Sadler, the Vice-Chancellor of the University, the President-elect, Mr. Riley Fortune, and Messrs. G. T. Porritt, Prof. Percy F. Kendall, W. Denison Roebuck, Charles Crossland, John W. Taylor, and Harold Wager, all past Presidents of the Union, the Treasurer and Secretaries.

After an epitome of the Annual Report had been given, and eleven new members had been elected, Mr. Sheppard

delivered his presidential address on ' Yorkshire's Contribution to Science,' from the chair.

After expressing thanks to the members of the Union for the honour accorded to him in adding his name to the illustrious list of Presidents of the Union since 1877, Mr. Sheppard very humourously referred to many incidents in his career as a scientific worker, and the developement of his passion for collecting ; the evolution of the collector as depicted by him being most wittily expressed.

There is probably no more capable member of the Union than Mr. Sheppard in the preparation of bibliography, his efforts in preparing for publication in *The Naturalist* for the past twenty-three years, the bibliography with respect to the Geology and Palæontology of the North of England, being excellent evidence in that respect. His researches therefore into Yorkshire's contribution to Science, which had entailed the perusal of a great mass of literature dealing with the contributions of eminent Yorkshiremen who had made their mark in the scientific world, as well as reference to the history and publications of the many Philosophical, Literary, and Natural History Societies of the County, emphasised the thoroughness of his work. Mr. Sheppard truly remarked that so great and glorious was the history of Yorkshire's contribution to science that it would be impossible for him that evening to give more than a brief outline of the extent of the work of past Yorkshire scientists, and of some of the more important Societies. The whole address was a masterly compilation, and proved deeply interesting and instructive. Very cordial indeed were the thanks to Mr. Sheppard for his address, and for the great interest he had taken in the work of the Union throughout the year, which was ably moved by Prof. Kendall, seconded by Mr. Harold Wager.

Mr. Sheppard's address will appear at length in the pages of *The Naturalist.*

At the close of the meeting a Conversazione under the auspices of the inviting Societies, the Leeds Naturalists' Club and Scientific Association, the Leeds Geological Association, the Leeds Co-operative Field Naturalists' Club, and the Leeds Conchological Club was held in the Biological Department of the University. Here was placed on view an excellent array of exhibits as follows :—By Mr. H. T. Todd, on behalf of the City of Leeds Training College, a collection of local shells and insects made by Mr. E. B. Smith, formerly a member of the Leeds Naturalists' Club, and a collection of Bees and other insects made by the late Mr. John Stubbins, for many years a member of the Union ; by Mr. A. Gilligan, pebbles from the Millstone Grit, with microscopic sections, specimens of grit from the Meanwood borehole with sections, fossils from

the same borehole, laminated clay from Woodlesford, Cephalopod from Ambergris, and Deer horn picks and pick marks in chalk; by Messrs. A. Burnet and J. H. Everett, fossils from the Robin Hood Quarries, details of which are given in the last volume of the Transactions of the Leeds Geological Association; Miss M. Lebour, Nests of earwigs with parents and eggs; by Professor W. Garstang, resting attitude of insects; by Dr. E. O. Croft, cases of lepidoptera; by Mr. J. W. Taylor, drawer of Helices with explanatory labels, and a framed sheet of drawings of shells; by Mr. G. B. Stanger, local insects; by Mr. C. Ardill, local lepidoptera collected between May and October, 1914; by Messrs. A. E. Bradley, A. Hodgson and J. C. Hesselgrave, bees and wasps, chiefly local; by Mr. A. E. Bradley, plants from the neighbourhood of Leeds, including recent additions to the Yorkshire flora; by Mr. T. Cockerline, local plants; and by the Leeds Naturalists' Club, record books and index cases showing the work of this Society in the field.

A capital lecture was delivered by Mr. Harold Wager, F.R.S., F.L.S., on 'The Perception of Light by Plants.' The main factors of his address were well emphasised and illustrated by numerous lantern slides showing his experiments with the epidermal cells of the leaf of the Spiderwort (commonly known as the 'Mother of Thousands'). Mr. C. A. Cheetham also showed a large number of his charming coloured lantern slides of wild flowers in their natural haunts.

Light refreshment was provided by the inviting Societies. The hearty thanks of those present was voiced by Mr. Riley Fortune, seconded by Mr. G. T. Porritt, to the authorities of the Leeds University for the use of rooms at the University, to the inviting Societies for their hospitality and help, and also to Prof. Garstang, Mr. A. Gilligan, and Mr. C. H. Grant for their services in connection with the local arrangements, the response of Dr. Sadler bringing to a close a most successful annual gathering of the Union.—W.E.L.W.

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White Blackbird at Barnsley.—A White Blackbird in splendid plumage was shot near Barnsley last week, and is now being mounted for the Barnsley Naturalists' Society's Museum.—W. BARRACLOUGH.

Heron Killing a Kestrel.—My friend, Mr. Bryan Langmead, writes to tell me of an encounter of which he was an eye-witness, in the following words:—'I saw a Kestrel in the air and a Heron by a stream, when suddenly the Kestrel gave a a swoop upon the Heron which curled up its neck, and ran its beak right through the Kestrel, killing it instantly. I had a look at the Hawk afterwards, and all its ribs were broken by the bill of the Heron.'—W. W. MASON.

YORKSHIRE'S CONTRIBUTION TO SCIENCE.

(Presidential Address to the Yorkshire Naturalists' Union, delivered at the University, Leeds, 5th December, 1914.).

By T. Sheppard, F.G.S.

The various Presidents of the Yorkshire Naturalists' Union, in whose steps I have the honour to follow, have, since 1877, dealt with a great variety of subjects in their addresses. Occasionally these have assumed the form of a general discussion on current scientific events; more rarely have they been suspiciously like a 'popular' lecture, but as a rule the President for the year has selected some topic which he has made a special study. The address of my immediate predecessor, Mr. Harold Wager, may be taken as an example, and I know of no better way in which your President can give you of his best, than by reviewing some subject that he has made peculiarly his own.

In endeavouring to follow this admirable lead, however, I am at once in a quandary. Lack of years and lack of experience have prevented me 'specialising' in any particular direction, even had ability and inclination directed. Instead, I have preferred the plan of trying to learn something of everything rather than everything of something, though in these days, both these tasks are impossible.

The best way, perhaps, to become thoroughly familiar with an object is to possess it, and the desire to possess is likely to develop into a collecting mania, which I am afraid may some day seriously 'get hold' of me. But I find on enquiry that nearly all my friends interested in natural science, even those who have reached the top of the tree (if I may so refer to a naturalist without any hint as to his ancestry), began their careers by collecting. Those who have preferred to try to know everything of something have naturally confined their attentions to one particular branch of collecting, and for the most part are not very harmful. In my own unfortunate case, however, the vain attempt to know something of everything has, perhaps, resulted in a species of collecting objects of such different descriptions and from such a variety of sources, that my efforts have possibly been misunderstood. At any rate, I distinctly remember being greeted by a Professor at this very University, and a predecessor of mine in this chair (I will mention no names) with, 'Well, Sheppard, and how's thieving?'

I mention this because I want to impress upon you the fact that I am obviously in the early stages of a scientific training. I have not yet been able to follow any special line of research, and therefore, my address must necessarily fall far short of the standard to which you are accustomed. I am still, in a small

way, trying to emulate the old-fashioned but delightful 'all-round' type of naturalist, of whom many of you will recollect excellent examples on the earlier excursions of the Yorkshire Naturalists' Union. But even with this ideal I have found it necessary to take such unnatural history pastimes as golf, etc., lest I develop into an 'all-round' naturalist in a more literal sense.

Probably by now it will have dawned upon you that this somewhat elaborate preamble is merely an apology for the shortcomings of my address, and for the glorious traditions of the Yorkshire Naturalists' Union I deeply grieve that upon this, the first occasion that a University has honoured us by allowing us to hold a general meeting within its walls, you have so poor a figure-head. (I trust I am not misunderstood in this term, I collect 'figure-heads,' so know something about them. A figure-head is usually a wooden effigy, more or less grotesque, placed on the front of a ship. It has absolutely no say or control over the ship's course, but should anything go wrong with the steering gear, it is the first to get bruised or damaged).

But from some slight acquaintance with the rules of the Union, I can assure you that the President is not self-elected—the figure head is chosen by the builders or by the crew. If it fails to add dignity to the craft the fault is not his, and doubtless the Union feels something like Touchstone when introducing Audrey to the Duke, 'A poor . . . ill-favoured thing, sir, but mine own.'

Once upon a time I used to write various notes and criticisms for a paper called *The Naturalist*, and the then editor, Mr. Denison Roebuck, prevailed upon me to prepare the annual bibliographies of geology and palæontology for the north of England, which have appeared fairly regularly ever since, with, I can only hope, some little benefit to the geologists, whatever the botanists, zoologists and the good old 'general body' of readers may have thought. I was recently horrified to find that I have prepared these since 1893, over twenty years ago.

Though these lists may not appear to be very imposing, only the true bibliomaniac knows what their compilation means. I will candidly admit that at the time I did not know, or the probability is that they would never have appeared. But for their preparation it is necessary, not only to record every and any independent volume, but an examination must be made of the various and numerous publications, reports, transactions, proceedings and monographs of the enormous number of geological, archæological, philosophical, microscopical, zoological, entomological, conchological, ornithological, botanical and other scientific, natural history, antiquarian or literary societies occurring in the area dealt with by the bibliography. And, on account of the failure of several societies to restrict themselves to the districts

in which their publications appear, it is necessary to refer to a legion of literary productions appearing in other parts of the country, and even abroad. But this is not all. Important papers of local interest frequently appear in the reports of our leading Metropolitan societies—the Linnæan, Entomological, Geological, Palæontographical, Antiquarian and even Astronomical: the Royal Society, the Royal Microscopical, Royal Geographical and others, as well as the British Association. Having formed a fairly good basis by an examination of all these as they appear, as well as of the lists of scientific publications, additions to the libraries, etc., which some of these societies issue, it is necessary to see the various scientific quarterlies; the monthly journals such as the *Zoologist*, *Entomologist*, *Entomologist's Monthly Magazine*, *Entomologist's Record*, *The Selborne Magazine*, *Knowledge*, *British Birds*, *Wild Life*, *The Geological Magazine*, *The Antiquary*, *The Geographical Journal*; *The Annals and Magazine of Natural History*; *Nature*; *The Mineralogical Magazine*, and, may I add, *The Naturalist*, and even stray notes on our area now and then appear in magazines specially devoted to others, such as the *Irish Naturalist*, *The Scottish Naturalist*, *The Lancashire and Cheshire Naturalist*, and so on.

Our Museums, too, which, quite properly, are yearly increasing in numbers and importance, are adding enormously to the flood of scientific publications. I recently saw that one of the most modern of our Yorkshire public museums had issued its 'Publication, No. 120.'

I have by no means exhausted the lists of likely sources for information in the compilation of bibliographies for the use of workers, but enough has been said to show that their preparation is likely to keep the compiler out of mischief. I am not now quite certain why I first commenced this kind of work; I can only hope it has kept me busy!

In our publication, *The Naturalist*, it has now and then been necessary to refer to the nature of the Journals or Proceedings sent for notice. At times, it is quite possible, the authors or editors or publishers have not been too hilarious over the review or the criticism offered. But in very many cases it seems to be forgotten that the essentials of a local publication should be that they should contain original notes bearing upon the district covered by that publication. Lectures on Protective Colouration, Astronomy, The Human Skull, Petroleum, Japan, Quartz, Climbing Plants, Corkscrews, and Peacocks (to quote some from recent publications) are all very well in their way, and are desirable and even essential; but it rarely happens that anything really original, *i.e.* a definite contribution to science, will be made, under these heads, to a local natural history society. Therefore, such reports usually merely gratify the vanity of the readers of the papers, which should be discouraged. A single record of a single shell, or

beetle, or bird, in a situation hitherto unknown, though such record only occupies a couple of lines, is of far more scientific value than a whole volume of abstracts of talky-talky addresses such as are prepared wholesale wherever the Young Men's and Young Women's Mutual Improvement and Literary and Debating Societies connected with the pseudo-religious institutes which abound in our towns and villages do congregate.

I believe the title of this address is ' Yorkshire's Contribution to Science.' To deal with the subject as a whole would occupy several addresses—in fact several volumes. The title might be taken in so very many different ways. For instance it would be quite permissible to refer to the excellent work of the Leeds University, for its ' contribution to science ' is more far-reaching than any of us imagine.

Wherever there is a gathering of scientific men in any numbers, you will find that the Yorkshireman takes a similar position to that of the Scot in the commercial world. He is there.

A hundred years before Linnaeus, Dr. Martin Lister, a Yorkshireman, was largely instrumental in preparing the alphabet, as it were, of our present study of natural science. Most of his work was done in Yorkshire. As pointed out by Mr. Denison Roebuck in his address to you in 1903 :—' His " Historia Animalium Angliæ " contained the first systematic accounts of the spiders, the beetles, the molluscs and the fossils of England, and he was also the first man to suggest the construction of geological maps.' and it must be remembered that this was in the days of Charles II.

The British Association, which has probably done more for the advancement of science than any other society in the whole world, and has recently held its annual meeting in Australia, was founded at York, by Yorkshiremen. Were the county's record of scientific attainments limited to that one fact alone, it could have no cause to complain. And it was John Philips, a mere museum curator, who was the pilot (not the figure-head) when that good ship was first launched.

It would be interesting to refer to the great work of William Smith, Sedgwick, Buckland, Strickland and a host of others ; yet I must refrain. The Yorkshire roll of honour in the scientific world is an extraordinary long one, but I will mention only the names of the Presidents of our Union since it was reorganised in 1877 (all of whom were connected with Yorkshire either by birth or by their work), and it will be seen that a great proportion of them are of world-wide renown :—Rev. W. Fowler, Dr. Clifton Sorby, Professor W. C. Williamson, J. Gilbert Baker, Lord Walsingham, Rev. W. H. Dallinger, Sir Ralph Payne Gallwey, W. H. Hudleston, H. E. Dresser, Dr. Walsham How, Professor A. H. Green, C. P. Hobkirk, Henry Seebohm, R. H. Tiddeman, Dr. Robert Braithwaite, John Cordeaux, Professor W. Boyd Dawkins, Sir Michael Foster, W. West, G. T. Porritt, Professor

P. F. Kendall, W. Denison Roebuck, A. H. Pawson, G. W. Lamplugh, W. Eagle Clarke, C. Crossland, Dr. Wheelton Hind, W. H. St. Quintin, Prof. A. C. Seward, Alfred Harker, J. W. Taylor and Harold Wager.

Many of those mentioned are certainly the greatest authorities in their respective studies. To refer to all their work would be an enormous undertaking. I may however be pardoned if I single out one to whose help and encouragement I owe much; I refer to the late Dr. Clifton Sorby. He was, unquestionably, a giant in the scientific world, and the full importance of his attainments will never be fully realized. Had Yorkshire done little else than produce a Dr. Sorby, it would have good cause to be proud of its contribution to science.

I can speak with perhaps greater pride of the work of Yorkshire's scientific worthies, as I am not prejudiced; for, though I have spent all the time I can remember in the county, I am not a native; a brief visit to the neighbouring county of Lincoln at a rather critical period of my little career, causing me to be, in the eyes of the law, a native of that shire.

Yorkshire's contribution to science. In connection with the bibliographical work already referred to, the collecting mania somehow seemed to take a hold on me and I began, by begging, buying, borrowing, or by other ways, to accumulate sets of various scientific publications; those referring to Yorkshire alone, which I have obtained, occupy an enormous quantity of book shelving.

While, I regret to say, I have not yet been able to secure complete sets of all the scientific publications issued in the county; I have, through the help of friends, carefully examined practically everything that I have been able to trace. As, in many cases, it is apparent that only one set is known (even of our own journal, *The Naturalist*, there appears to be only one really complete set in existence !), it seems desirable to place on record, before it is too late, particulars of the work of our Yorkshire societies and their publications, with some indications of the contents, so that future workers will be able to know what has previously been done, and thus get a good foundation for their researches.

I should like to lay particular stress on the necessity for students to become familiar with the records of their predecessors in the same field, as over and over again it is found that alleged 'new records' have been known years previously by earlier naturalists. Not long ago a friend of mine sent me a lengthy account of an early and important record, which had obviously been transcribed at great pains and printed at some cost; and he was quite unaware that every word had been issued *a century* previously in the publication of our oldest London Society !

Quite apart from the quantity of publications now being issued, there is an enormous number of magazines and journals

which have had their little day and ceased to be. To these, also, as will be seen later, Yorkshire has contributed a very fair share. Of those of more general interest, I may mention two, viz., *Science Gossip*—of which thirty-seven volumes appeared between 1865 and 1902; and *Natural Science*, a magnificent publication, which was 'eliminated' at the close of its fifteenth volume, in 1899. Comparing these with some of the so-called scientific publications now appearing, it can hardly be said that the law of the survival of the fittest always applies to scientific serials.

In examining some of these old journals it must be admitted that so far as typography, illustrations, paper, and general 'get up' are concerned, the modern publication does not always show to advantage in comparison with its predecessors of nearly a century ago. In those days the illustrations were frequently made by means of copper plates, and were works of art. The printer took a pride in the arrangement and spacing of his type, and the paper was often hand-made and lasting. The maps and diagrams were beautifully prepared and carefully and artistically coloured—frequently by hand. To-day, the apparent feverish haste of production, the careless composition, and process block frequently made from untidy sketches or poor photographs, are not pleasant. Nowadays a photograph is prepared in a few minutes, a block is made in a few hours, and printed on paper which, with care, may last a few months.

An examination of the material published by the county and town societies, would seem to indicate that the centre of scientific activity has shifted from time to time. York once took a good lead; Huddersfield at one time was a long way ahead; Halifax had its day; Leeds, a while ago, produced the most; while, at the present day, judging from the quantity of different societies' journals there published, the 'centre' is most eccentric of all, being at Hull, in a corner of the county.

The commencement of the systematic publication of scientific literature in the county may be said to have occurred early last century, when Philosophical and Literary Societies were formed in the large towns. These societies discussed—really discussed—papers read at their meetings, and issued annual reports, the earlier numbers of which, more especially, contained much valuable scientific information. The chief pride of these societies, however, was in the museums they founded. To-day, I regret to say, most of the societies have developed or devolved into popular lime-light lecture concerns, and are usually neither Literary nor Philosophical.

County societies then followed, such as the Yorkshire Geological and Polytechnic Society, the Yorkshire Naturalists' Union and the Yorkshire Archæological Society. Later, came the Field Clubs, which to some extent are carrying out the former work of the Philosophical Societies. Each Field Club has

its ups and downs—for a few years it flourishes, which usually means it begins publishing; then the cost of the production becomes difficult to meet after a few years, and so the publication ceases; sometimes the society ceases also.

From a somewhat intimate acquaintance with the meetings of our natural history, geological and antiquarian societies, as well as with their publications, I have been led to seriously consider whether the time has not arrived when some change should take place in the nature of those meetings and publications.

A century ago our philosophical societies led the way. Their meetings were well attended, papers were read, discussed and printed. They were of such a character that a good proportion of the hearers could understand them and appreciate their import. As time went on the subjects became more and more special in their scope, though, from a strictly scientific point of view, probably more important. The papers appealed to fewer and fewer; discussions became a thing of the past, and the membership grew less. To keep up an interest, the 'popular' lecture made its appearance, with the great aid of the lantern, and more recently with the cinematograph, and so 'popular' have these become that their titles only are mentioned in the Society's Reports; and at the meetings themselves there is a frantic rush for the door immediately the lecture is over. In fact, at some societies in the county at which I have lectured in recent years, even the vote of thanks is dispensed with in order to prevent the annoyance made by hurrying feet during the few brief moments that are occupied by the passing of the vote.

To carry on the work originally performed by these philosophical societies, county societies and field naturalists' clubs came into being. As already pointed out, their meetings and discussions were quite as interesting and quite as valuable as were those of their predecessors. But they, in turn, except in cases where great care is exercised, are ascending or descending in the same way, and interest in them is being lost. I am familiar with quite a number of important societies in Yorkshire to-day, geological, antiquarian, and natural history, which are exhibiting traces of this senile decay. These meetings lack the enthusiasm of former days; the papers read are too technical; their publications appear less regularly, and when they do, are certainly 'thinner' and contain a large percentage of papers which can only appeal to a very small section of the members.*

* An experiment in this direction was recently tried by the Geological Section of the Yorkshire Naturalists' Union, and proved thoroughly successful, as was reported in *The Naturalist* for December, pages 390-2. A meeting was held at Hull, which occupied the afternoon and evening of Saturday, November 7th. Over a dozen short papers were read and discussed, each one given in simple language, and was readily understood by the large audience from various parts of Yorkshire and Lancashire.

I do not profess to be particularly patriarchal, but I can remember the time when I awaited the reports of these societies with pleasurable anticipation, and read them through from cover to cover. And so did many others. I will be bold enough to say that to-day, in the case of practically every publication of any importance issued by the societies referred to, not a single individual outside a lunatic asylum, could read them through. Yet they are all necessary, all exceedingly valuable, all certainly contributions to science. But the increasingly specialised nature of the memoirs appeals to a decreasingly small number of members.

These societies are nearly all reaching a critical stage in their history, and without actually calling in the aid of stage oratory or the moving marvels of the camera, everything must be done to keep up an interest in the work, by 'beginning again,' as it were. We must descend from the rarified atmosphere of the heights, and mix with those in the valleys and on the plains, where life is much more normal and much more healthy.

I am very anxious to take advantage of the position in which I am now placed, and to do my very best to drive these facts home. Yorkshire's contribution to science, of which I am now only able to deal with a very small section, is a glorious one. That of no other county can approach it. We must see to it that there is no falling back.

The recent revival in 'Nature Study,' which, quite properly, is now officially recognised by the Board of Education, and has been taken up in a most encouraging way by both teachers and scholars at most of our schools, has not, as yet, made the slightest difference to the work of our natural history societies. There is no increase in their membership directly due to this cause (few can boast an increased membership nowadays), nor to the number of published contributions to science. True, the book market has been flooded with 'popular' books on various aspects of natural history, to most of which the adjective 'so-called' should be added; and the recent attempts to produce popular natural science magazines have been both 'extensive and peculiar.' But as a result of all this, the actual additions to the ranks of the field naturalist are practically nil.

During the past twelve years we have lectured to several thousands of Hull's scholars at the city museums; they are accompanied by their teachers, they come in single classes, and after the lecture spend the rest of the morning in examining the specimens. Scores of lectures have been delivered on natural history, geological or antiquarian subjects, and they have been given in simple language, easily understood by the children. Unquestionably the result is that the scholars are better acquainted with the things that happen in every-day life, they have a broader outlook, and we hope the result will be that in future years there will be a greater number of geologists, or field naturalists, or

antiquaries in the city. Personally, I doubt it ; and I am not going to admit that the lectures are not interesting or easily understood by the youngest. It almost makes one believe that the true naturalist is born, not made.

It must not be considered that in the following notes there appears anything like a history of the various Yorkshire scientific societies. I have rather dealt with the matter that has been *published*, and which is therefore to some extent accessible. Perhaps it is fortunate that I have not given myself sufficient time in the preparation of this address for such a history, desirable as it is. I may possibly revert to it, somewhere, on a future occasion. Material for such a work is accumulating in great quantity, but with regard to the earlier societies, and especially those which have left no definite record behind, the work is exceedingly difficult and laborious, and necessitates searching through piles of old newspapers and reports of meetings and advertisements in numerous different magazines.

In dealing with such a subject as pre-historic man, it is perhaps a little difficult to say where the science of geology ends and archæology begins, and as no naturalist worthy of the name can leave *homo* out of his classification, and has necessarily found that the proper study of mankind is man, so it is impossible to leave out of our purview the various journals and magazines in which archæological matters are considered. This is perhaps as well, as quite apart from the papers on the early inhabitants of our islands ; the churchwardens' accounts, etc., and the topographical items, frequently contain matters of interest to the naturalist or geologist. These are therefore being included.

In addition to the publications actually issued in the County, I propose to deal with such others as have an important bearing on our work.

(*To be continued.*)

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West Yorkshire Mosses and Hepatics.—During a few rambles in West Yorkshire with my friend, Mr. Ll. J. Cocks, the pleasure was afforded us of meeting with the following rare mosses and hepatics in new localities, viz. :—*Seligeria acutifolia* var. *longiseta*, *Fissidens rufulus*, *Bryum concinnatum*, *Bryum mildeanum*, *Mnium orthorrhynchum*, *Amblystegium confervoides* and *Amblystegium sprucei*, *Pedinophyllum interruptum*, *Scapania bartlingii*. For the two *Bryums* I find no record for West Yorkshire.—R. BARNES, Harrogate.

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A past president of the Yorkshire Naturalists Union, Mr. G. W. Lamplugh, has been elected on the Council of the Royal Society.

NEW AND RARE YORKSHIRE SPIDERS.

J. W. HESLOP HARRISON, B.Sc.
Middlesbrough.

SINCE my last paper dealing with the Arachnid Fauna of Cleveland appeared, two very remarkable species have been discovered in this area and, in taking this opportunity of recording them, I append notes on other spiders, important either as being new to the North Riding, or as affording new localities for rarer species.

Cornicularia karpinskii Camb.—This is an Arctic and Alpine species, first described from abroad by the Rev. O. P. Cambridge as *Erigone karpinskii*,* although it is very probable that the species described as *Erigone pavitans* from Cheviot is the same spider, in which case, as the Rev. J. E. Hull informs me, the name *karpinskii* will sink to *pavitans*, the latter having a slight priority. Granting that *C. pavitans* and *C. karpinskii* are synonyms, then the first British record would be that of the solitary type female taken in 1872. If the two spiders are to be regarded as different then the first British record was made by the Rev. O. P. Cambridge in recording Mr. W. Evans' Leadhill, Lanarkshire, capture in 1900, the second being made in the same note and referring to captures made by Dr. Jackson in 1900, in Cumberland. My captures, therefore, in this neighbourhood, provide the third British and the first Yorkshire specimens.

Strange to say, however, my specimens came from the marshes at the mouth of the Tees just within the breakwater, at a point which has quite unexpectedly yielded other Arctic forms, e.g., the beetle *Miscodera arctica* Payk. This, of course, affords scope for the suggestion that the proximity of the port of Middlesbrough is responsible for the occurrence of the spider here. All I can say is that a passage from Middlesbrough to its Cumberland locality could be more easily made than to the present one. As a matter of fact, such a journey, for a spider, is a physical impossibility. Further, I have now taken all the species of Cornicularia, except *C. kochii*, both on the sea coast and on the hills, and, in the case of that spider, I have taken it on the coast, whilst my uncle has captured it in the hills in Northumberland. In connection with this, it is scarcely necessary to refer to the well-known distribution of certain plants, e.g., *Plantago maritima*, found both on the sea coast and in mountainous districts.

Cnephalocotes ambiguus Camb. This species was described† from a single male taken by Mr. W. Evans, in Arran

* Proc. Zool. Soc., 1873, page 447.
† In the Proc. Dorset N.H. and A. F. C., vol. XXVI., page 67.

(not in Bute as therein described). The specimen remained unique until the Rev. J. E. Hull and I took a large number of examples on the flats on the south-east side of Findhorn Bay, in Morayshire, in August, 1910. No other specimens have been turned up until I captured several of both sexes at a height of nearly 1,000 feet on Easby Moor, on Whit-Monday, 1914. Just as in recording *Cornicularia karpinskii* I had to note a peculiarity in distribution, so I have in the present case; in this instance the positions are reversed, for here we have a case of a spider considered peculiar to salt marshes turning up on the hills! Not that when one analyses the conditions under which the spiders live are any great differences observable; when we got *Cnep. ambiguus* at Findhorn, it occurred in wet spots at the roots of such plants as *Aster tripolium*, *Triglochin maritimum*, *Armeria maritima*, amongst low growing mosses and liverworts, whilst on the moors I got it in mosses and liverworts growing amongst *Drosera rotundifolia* and various Junci, also in wet spots. The Rev. J. E. Hull identified this species.

Erigone promiscua Camb.—1 ♀ Eston Moor.

Mengia warburtonii Camb.—1 ♀ Eston Moor.

Ceratinella scabrosa Camb.—Several, Eston Moor.

Bathyphantes pullatus Camb.—Both sexes, both on Eston and Great Ayton Moors. I have now taken all the species of the genus Bathyphantes on Eston Moor.

Leptyphantes tenebricola Wid.—Eston Moor.

Agyneta decora Camb.—Great Ayton Moor.

Agyneta cauta Camb.—Great Ayton Moor.

Pirata hygrophilus Thor.—Goathland.

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The Genitalia of the British Geometridae. By **F. N. Pierce, F.E.S.** Liverpool, 1914. After five years since the publication of the first volume on the Genitalia of the British Lepidoptera, which dealt with the Noctuæ, we hail with pleasure the appearance of the second volume, which deals with the Geometridæ. The volume on the Noctuæ was so fully noticed in this journal (*The Naturalist*, June, 1909, pages 239-240), that there need be little said concerning this companion volume. It is in every respect equal to the first, both in the descriptions and plates, and practically all we said about the first volume can be applied to this. The author has, we think, erred in basing his classification of the species entirely on the differences in the genitalia, for its absurdity is apparent when it involves, as is here does, the placing of our very familiar *Boarmia repandata* and *B. gemmaria* in different genera (*Alcis* and *Selidosema* respectively). These two species are so much alike that for some time one of our best southern lepidopterists insisted that a northern melanic form of *repandata* really belonged to *gemmaria*. The larvæ and habits of the two species, too, are almost entirely similar throughout. Yet Mr. Pierce actually places another species (*A. glabraria*), which is widely different both as larva and imago from either, *between* them. The book altogether, is a grand addition to our literature on the lepidoptera, and we hope that the third volume, which is to deal with the Tortricidæ, may make its appearance long before five more years have passed—G.T.P.

In Memoriam.

WILLIAM CASH, F.G.S. (1843-1914).

As this somewhat eventful year is drawing to a close, Yorkshire naturalists will learn with regret of still another serious gap in their ranks. On December 16th our old friend William Cash passed away. He was returning from a short walk, when he fell down and died instantly.

William Cash, F.G.S.

Quite apart from his scientific attainments, which will long outlive him, William Cash had a charming personality which at once endeared him to all with whom he came in contact. He was ever on the alert to perform a service for the comfort of others.

Professionally he was an accountant. In former years he was connected with one of the Halifax banks.

Though his earliest papers referred to the mollusca (so long ago as 1877 he wrote on the Carboniferous Cephalopoda) he soon became deeply interested in the fossil plants which occur in such a remarkable state of preservation in the 'Hard Bed' of Halifax. His researches among these—largely with the aid of the microscope—are of world-wide reputation, and in 1892 a French palæobotanist dedicated a work on 'Lepidodendron selaginoides' to Mr. Cash.

Most of his scientific work has been in elucidating the structure of Coal Measure plants, in connection with which he worked with Williamson, Hick and others, appreciative obituary notices of whom it was his lot to write. In *The Naturalist* for 1906 he gave valuable instruction on 'What and How to Observe, Collect and Record,' in the way of coal fossils. His first contribution to our journal was made in 1881, his last in 1912. His most important papers on coal plants appeared in the Proceedings of the Yorkshire Geological Society, which he at one time edited; he had also filled the office of Treasurer to that Society.

In view of his work in the county, the Yorkshire Naturalists' Union recently elected him an honorary life member; he had previously occupied official positions on its committees.

He was one of the founders of the Halifax Scientific Society, and had been its President. He was also President of the Halifax Geological Field Club, and was at one time Treasurer to the Halifax Literary and Philosophical Society. He was formerly a Governor of the Halifax Museum, and latterly was its honorary curator. He also took a prominent part in the promotion of a Public Library for Halifax, and between 1883 and 1892 was a member of the School Board, being Chairman in 1889. He was an honorary member of the Bradford Natural History Society, and of the Halifax Scientific Society, and a life member, and one time President of the Conchological Society. He was elected a Fellow of the Geological Society in 1873.

In recent years he has done good service by giving popular lectures, in connection with which he paid frequent visits to various parts of the county.

His fine collection of micro-preparations of the coal plants—about 700 in all—known as the 'Cash Collection,' has been for some time in the University Museum, Manchester. He has also supplied specimens to the national collection at South Kensington. At the time of his death he was assisting Prof. Kendall in some researches in connection with Yorkshire Coal Measures.

In 1911 it gave pleasure to many of his friends to learn that he had received a Civil List Pension; and he also was awarded a grant from the Murdoch Trust of Scotland.

Mr. Cash leaves a son, who is in America, and a daughter,

who for many years has been his constant companion. Readers of *The Naturalist* will tender them their sincere sympathy.

T. S.

The following is a list of his papers and monographs:—

1877. Notes on Carboniferous Cephalopoda. *Y.*
1878. *A Contribution to the Flora of the Lower Coal Measures of the Parish of Halifax, Yorkshire. *Y.*
1879. *On Fossil Fungi from the Lower Coal Measures of Halifax. *Y.*
— *Notes on Traquaria. *Y.*
1881. *A Contribution to the Flora of the Lower Coal Measures of the Parish of Halifax. *Y.*
— Yorkshire Mollusca, etc. (Letter). *N.*
1882. On the Halifax Hard Seam. *B.A.*
— *On a Fossil Stem from the Halifax Coal Measures. *B.A.*
— Yorkshire Fossil Mollusca. *Y.*
1883. The Young Stage of some Carboniferous Cephalopoda (title only). *Y.*
— Preliminary Report of the Committee on the Flora of 'Halifax Hard Bed, Lower Coal Measures.' *B.A.*
1884. *Contributions to the Fossil Flora of Halifax. *Y.*
— Report of the Committee for Investigating the Fossil Plants of Halifax. *B.A.*
1887. On the Fossil Fructifications of the Yorkshire Coal Measures, I., Calamostachys. *Y.*
— Palæontology (Lepidodendron). *W. N.*
— Palæontology (Calomostachys). *W. N.*
1888. †Report on the Carboniferous Flora of Halifax and its Neighbourhood. *B.A.*
1889. *The Structure and Affinities of Lepidodendron. *Y.*
1890. ‡On Lepidophlois and Lepidodendron. *Y.*
1893. Obituary, James W. Davis. *Y.*
1895. In Memoriam, Professor William Crawford Williamson (with List of Memoirs). *Y.*
1896. In Memoriam, Thomas Hick (with List of Memoirs). *Y.*
— In Memoriam, William Crawford Williamson. *N.*
1897. Some Recent Scientific Discoveries (Presidential Address to the Halifax Scientific Society). *H. N.*
— The Flora of the Halifax Hard Bed. *L.A.*
1901. In Memoriam, Walter Percy Sladen, F.L.S., F.G.S., F.Z.S. (with List of Memoirs). *Y.*
1906. The Fossil Plants of the Yorkshire Coal Measures. Part I.—What and How to Observe, Collect and Record. *N.*
1908. In Memoriam, Robert Law, F.G.S. *N.*
1911. (Land and Freshwater Shells at Ingleton). *N.*
1912. 'The Lost Towns of the Yorkshire Coast' (review of). *N.*
— Mollusca (at Tanfield). *N.*
— Trientalis europea, L., at Bradshaw, Yorkshire. *N.*
— Dispersal of Fresh-water Shells. *N.*

Y. Proceedings Yorkshire Geological Society.
B.A. Reports of the British Association.
L.A. 'Transactions Leeds Geological Association.'
H. N. 'Halifax Naturalist.' *W. N.* 'Wesley Naturalist.'
N. *The Naturalist.* * Jointly with Thos. Hick.
† Jointly with W. C. Williamson. ‡ Jointly with James Lomax.

COAL MEASURE PLANT RECORDS.*

MARY A. JOHNSTONE, B.Sc., F.L.S.

SOME time ago I collected a few plant fossils from a quarry belonging to the Bradford Brick Company and I have been asked to add the list to the existing Yorkshire records. Most of the specimens were found in clay nodules, embedded in the shales below the Better Bed Coal; some were on the flaky layers of shale itself. Mr. Kidston was kind enough to identify them, and the list is as follows :—

Calamites varians Sherul. var. *insignis* Weiss.
Calamites suckowi Bgt. sp.
Calamites ramosus Artis.
Sphenopteris obtusiloba Brogt.
Sphenophyllum myriophyllum Crépin.
Mariopteris muricata Schl. sp.
Urnalopteris tenella Bgt. sp.
Lepidodendron obovatum.
Zeilleria delicatula Sherub. Sp.
Zeilleria trichomanoides Kidston M.S.
(Third locality for this).

Calamites (*Calamitina*) *varians*, was so beautifully preserved and presented features of so much interest, that I thought it worth a full description; this may be found in the Proceedings of the Manchester Literary and Philosophical Society, Vol. 56, No. 17.

The fossil is, in my opinion, the cast of piece of decorticated stem, the surface markings reproducing details of the exterior of the woody cylinder. There are present one complete and two incomplete groups of internodes of unequal length showing evidence of periodicity in their arrangement.

The surface texture is longitudinally furrowed, the ridges representing the secondary xylem and the furrows the secondary medullary rays. The nodal lines are marked out as ridges, along the top of which lies a chain of contiguous leaf-bases. The details of some of these can be made out, and correspond with regions to be found in microscopical preparations.

The branch scars are arranged in whorls. as is typical of the sub-genus Calamitina; they are very closely crowded together, as in the case of the leaves; the various markings within the scars can be identified by reference to petrified specimens.

The significance of the variation in the length of the internodes is one of the interesting questions connected with these calamites.

* Given at the meeting of the Geological Section of the Yorkshire Naturalists Union, at Hull.

The periodic recurrence of short and long internodes seems to be restricted to the Calamitina, with their ringed arrangement of small branches. I have found no examples, figured or in specimens, among the Eucalamites or the Stylo-calamites.

Williamson (1), Stur (2), Kidston (3), and Horwood (4), have figured and described this grouping of internodes. Williamson says it *may* have some specific meaning ; Stur and Kidston do not discuss it ; Horwood considers that the short internodes furnish support to the whorls of branches.

Before trying to clear up the functional point, it is necessary to decide which is the upper region of the fossil. The evidence is of two kinds. In the first place, there is a line of what are pretty certainly leaf-scars subtending each branch node, whilst certain details in the branch scars themselves can be identified with parts proved in structural specimens to be the upper portions of the branches. Secondly, there is complete similarity with other branching stems, about which there is no doubt as to the interpretation. In many of Stur's figures the relative positions of leaves and branches are plainly evident, and the branches bearing the whorls of leaf-scars are still in connection with an older axis. In all cases the internode *below* the branches is relatively long.

It seems clear that in some species of Calamites, a recurrent cycle of internodes was correlated with the occurrence of whorls of branches, and that immediately above the branch node there appeared one or more stunted internodes. This can hardly be regarded an arrangement to furnish special support for the branches, as Mr. Horwood suggests. It is more probable that it was a condition of growth determined by the presence of the numerous branches ; the diversion of a large amount of food material outwards to these secondary members might lead to an imperfect supply being furnished to the main axis just above them.

REFERENCES.

(1) Williamson, W. C. (1871). 'On the Organisation of the Fossil Plants of the Coal Measures.' Phil. Trans., vol., 161, page 495, plate 27, fig., 30.

(2) Stur, D. (1887). 'Die Carbon-flora der Schatzlarer Schichten, Abt II., Die Calamarien.' Abhand K. K. Geol. Reichsaust, Wein, Bdl. XI., Abt 2.

(3) Kidston, R. (1889). 'Fossil Plants in Ravenhead Collection.' Trans. Roy. Soc., Edin., vol. 35, No. 10, plate I., fig. 1.

Kidston, R. (1908). 'Les Vegetaux houillers du Hainault Belge.' Mem. Mus. Roy. Hist. Nat. Belg., T. IV., plate XIII., fig. 1.

(4) Horwood, A. R. (1910). 'On Calamites Schützei, Stur.' Journ. Linn. Soc., vol. 39, page 279.

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A paper on 'The Equipment of a Yorkshire Quarry' (Craven district), by R. Parker, appears in 'The Quarry' for December.

A YEAR'S SCIENTIFIC WORK IN YORKSHIRE:

BEING

THE YORKSHIRE NATURALISTS' UNION'S FIFTY-THIRD ANNUAL REPORT,

FOR 1914.

(*Presented at Leeds, 5th December, 1914*).

THE FIFTY-SECOND ANNUAL MEETING was held at York on Saturday, December 13th, 1913.

The Presidential Address was delivered by Mr. Harold Wager, F.R.S., F.L.S., Leeds, on "The Movements of Micro-Organisms in response to External Forces." In a masterly manner, Mr. Wager described his investigations of one of the flagellate infusoria, *Euglena viridis*. Additional interest was added by an excellent series of lantern slides. This address was published in *The Naturalist* pp. 171-178 and 207-214.

The best thanks of the Union are due to the Yorkshire Philosophical Society for the hospitality extended to the Union, and for placing at their disposal the magnificent Lecture Theatre attached to the Museum, in which the meetings were held.

SIX FIELD MEETINGS had been arranged, but five only were carried through, the one to Doncaster fixed for the 19th September being abandoned; Doncaster being one of the centres for military purposes, and suitable accommodation could not be obtained. Excellent reports of the Excursions have appeared in the pages of *The Naturalist*, accompanied by illustrations. The Excursions were as follows:—

Yorks., Mid. W.—Knaresborough (Easter Week-end), 11th to 13th April.
,, S.E.—Filey (Whit. Week-end), May 30th to June 1st.
,, N.W.—Askrigg, Saturday to Monday, 27th to 29th June.
,, N.E.—Sleights (for Eskdale), (August Bank Holiday Week-end), 1st to 3rd August.
,, N.E.—Mycological Meeting. Sandsend for Mulgrave Woods, 3rd to 8th October.

In addition, the Marine Biology Committee held its Annual Meeting at Whitby from 18th to 22nd September, and successful gatherings have also been held by other sections during the autumn and winter months.

The usual Excursion Programmes, full of useful information on the districts visited, have been printed and distributed prior to the Field Meetings.

1915 Jan. 1.

Permission to visit estates has readily been granted by various Landowners, while on the occasion of the visit of the Union to Glaisdale on August 1st., Glaisdale friends kindly provided afternoon tea. The best thanks of the Union are due to the Railway Companies who have again afforded the usual cheap travelling facilities.

THE EXCURSIONS FOR 1915 will be as follows:—

Yorks. Mid.W.—Sawley, near Ripon, Saturday, April 24th.
,, N.W.—Settle (Whit. Week-end), May 22nd to 24th.
,, S.E.—Bishop Wood, near Selby, Saturday. June 19th.
,, S.W.—Hebden Bridge, Saturday, July 17th.
,, N.E.—Saltburn (August Bank Holiday Week-end), August 7th to 9th.
,, N.E.—Mycological Meeting, Scarborough, September 24th to 29th.
,, N.E.—Marine Biology Committe Meeting, Scarborough.
December 4—Annual Meeting at Keighley.

OBITUARY.—The Union has to regret the loss of many prominent Yorkshire Naturalists. On the 14th May one of the Ex-Presidents, Mr. William West, F.L.S., passed from among us in his sixty-sixth year.

He was the most kindly and unassuming of men; a hard worker, a conscientious student, and one whose love of nature was beyond all description. Most painstaking and persevering in his work, he has left many important memoirs which will ever remain monuments to his memory. Yet he was one of the type of men of whom it can truly be said that his greatest achievement was in the encouragement he gave to others.

An "In Memoriam" notice appeared in *The Naturalist*, pp. 227-230 and 257-260. Obituary notices have likewise appeared in the pages of the same magazine relative to Major G. B. Barrett-Hamilton, Mr. Frederick Brittain, J.P. and Mr. Uriah Bairstow (the last two were members of the General Committee of the Union).

DIVISIONAL SECRETARIES AND LOCAL TREASURERS.—The duties devolving upon these gentlemen have been willingly and ably performed, and the thanks of the Union are tendered to them for their assistance. The Executive have, with much regret, accepted the resignation of Mr. W. Robinson, Sedbergh, as Divisional Secretary for N.W. Yorks., and desire to place on record an appreciation of the many valuable services rendered by him to the Union in that capacity.

GENERAL COMMITTEE.—The following have been elected as members of the General Permanent Committee of the Union:—

Mr. Rosse Butterfield, (Keighley), Dr. E. O. Croft, (Leeds), Dr. W. J. Fordham (Bubwith), Mr. Greevz Fysher (Leeds), Mr. John Holmes (Crosshills), Mr. W. H. Burrell (Leeds), and Mr. F. H. Edmondson (Keighley).

Sectional Committees.—The General Permanent Committee has accepted the recommendations of the Executive as to the reconstitution of the Sectional Committees. A new Section, Section A, General Biology, has been added, under which the Marine Biology Committee and Micro-Biology Committee have been placed. The Committee of Suggestions for Research, having accomplished its work, has been dissolved.

VERTEBRATE ZOOLOGY SECTION.

West Riding Report.—Mr. Riley Fortune writes :— Summer migrants arrived in many instances somewhat earlier than their average time. This was especially noticeable in the case of Swifts. The average date of arrival in the West Riding is May 6th., near Harrogate they arrived on April 28th., a date unprecedented. On May 2nd. and 3rd., I saw some hundreds of these birds in the Wharfe valley near Otley. The first Hooded Crow was seen at Harrogate on October 5th., much the earliest record I have.

Nesting commenced early and continued late. In the Harrogate district a pair of Starlings and several Dippers were feeding young in the last week of March. A Sparrow was seen carrying nesting materials on October 17th.

Game birds appear to have done very well, particularly Partridges, the absence of heavy thunderstorms during the hatching period being especially favourable to them.

Many species continue to decrease in numbers, this is particularly the case with Whinchats, Redstarts and Grasshopper Warblers. Corncrakes have not been nearly so abundant as last year and Spotted Flycatchers have shown a great falling off in numbers.

The almost sensational "setback" to the annual increase of our local starlings has not been accentuated.

A Bittern was unfortunately shot in ignorance of its identity in January, after its second appearance at a pond in a private garden, where gold fish were preserved.

Mr. Alfred Kaye reports a pair of Dotterel on their old resting ground at Lindley, near Huddersfield, on May 13th: the last record being for May 21st, 1906.

Mr. Booth has investigated the doubtful addition to the Yorkshire aviafauna, in the shape of a Black-headed Bunting, (*Emberiza melanocephala*), vide the "Bull. B.O. Club." No. CXCVIII, and *The Naturalist* 1914, pp. 201-2, and it has proved to be much more doubtful, after investigation.

The discovery of a *regular* nesting place of the Short-eared Owl in the West Riding is worthy of note, though it is not advisable to specify the particular locality! Four pairs nested this year.

East Riding Report.—Mr. E. W. Wade writes:—The Common Mouse and Short Tailed Field Vole have appeared in unusual numbers on the Wolds and in Holderness, and the corresponding increase in the numbers of breeding Barn Owls has been remarkable. The birds in many cases were sitting by mid April and had hatched young on 1st. May. The writer saw or heard of 11 pairs breeding where ordinarily the number would be three or four. and old haunts untenanted for years, were again occupied. The Brown Owl was more fertile than usual, but the Long-eared only normal.

Migrants on the average were a few days earlier than in 1913. All (species except waders, and such warblers as require an abundance of moisture, e.g., the Sedge Warbler), have responded to the stimulating effect of abundant sunshine and have done well. Several clutches of six amongst the Rooks and Carrion Crows were observed, and Jackdaws had full clutches by 21st April—at least a week earlier than usual. Two clutches of Willow-Warblers of eight eggs each were observed on 10th May. The Hedge Accentor was laying in March and the Greenfinch before the end of April, whilst a Brown Linnet was seen as late as 8th August with three eggs.

The Swallows and House Martins at last appear to be recovering lost ground and have done better than for many years.

The Starling has not yet recovered from the effect of last year's epidemic of gapes.

The Corncrake has been more conspicuous by its absence than ever, and the writer has knowledge of but six pairs in the district from Howden to Bempton.

The Whinchat lingers on in slightly greater numbers than last year.

Partridges have at last had a splendid season, following an almost continuous run of misfortune for seven years. Wild Pheasants also have done well.

The Stone Curlew in the protected area maintains its numbers, but further increase appears unlikely because outside this area the eggs get destroyed in the process of tilling the soil. The watching at Spurn has been more efficient than for some years past; the system of marking the eggs has been adopted with good results. The increase in the numbers of Ringed Plover is again satisfactory. (see *The Naturalist* for November).

The system of keeping the Mere at Hornsea absolutely undisturbed, as adopted when J. Taylor was appointed watcher, is at last bearing its fruit. A notable increase in the numbers of breeding Pochards and Tufted Ducks has taken place. At least one pair

of Shovellers reared nine young. Three pair of Great Crested Grebe nested and broods of three and four young were seen. On the other hand the Bearded Tit appears to be vanishing, as Taylor has not seen the bird since May, when he noticed one pair only.

Mr. V. G. F. Zimmermann again records the nesting of the Pochard at Skipwith Common.

An unusual migration of Waxwings took place in the winter owing no doubt to the exceptionally hard weather in Scandinavia. In the East Riding about a dozen specimens were procured from late November to January.

From 8th to 31st January, great numbers of Woodcock appeared in the district from Scarbro' to Spurn and record bags were made. Mr. N. F. Ticehurst attributes this to stress of weather on some part of the Continent having forced the birds to shift their quarters. Goldcrests appeared in numbers in Holderness at the same time.

A Whooper Swan was shot near Leven in the winter.

On 4th April a flock of Bramblings was observed in Brantingham Dale.

Mr. F. Boyes reports that the Pink-footed Goose arrived in the Wolds on 27th August instead of the usual date, 19th September.

Mr. W. Hewett saw two Hooded Crows near Bempton on June 23rd, and records an Albino Sparrow captured alive near Beverley on July 9th.

The North Riding.—Mr. T. H. Nelson, J.P., writes:—There is little of interest to record for the past season, beyond the most extraordinary and unprecedented destruction of sea-birds in the cyclone of 2nd July, of which an illustrated article appeared in *The Naturalist* for August.*

A catastrophe similar to that at the Teesmouth occurred on 4th July on Mr. E. B. Emerson's estate at Swainby in Cleveland, when the grouse on Live Moor were practically wiped out by a fall of ice, although the main moor, only half a mile distant across Scugdale, was not affected by the storm.

For the present season all shooting on the coast is prohibited by the military authorities.

Wild Birds and Eggs Protection Committee.—The amount received in subscriptions for 1914 is £17 9s. 6d., which together with the balance in hand, makes a total fund of £41 13s. 10d. The expenditure amounts to £29 0s. 9d., leaving a balance in hand of £12 13s. 1d.

The birds at Spurn have had a successful nesting season, the watcher, G. Hall, has been the best man we have had on this ground. He has furnished a detailed list of the numbers of nests seen with the results from them.

* For 'Sandsend' under the photograph there appearing, read 'Teesmouth.'

When the men commenced climbing at Bempton it was discovered that for some reason or other the Falcons had deserted their eggs, two in number. One of the eggs proved on investigation to be addled, the other contained a young bird near the point of hatching. The eggs, somewhat weathered, were handed to the Hull Museum. For some seasons rumours have been prevalent that these birds are disturbed by collectors before the climbers appear on the scene to give them their protection. The result this year certainly justifies a suspicion that this is the case. It may perhaps be advisible, if funds permit, to place a special watcher on the spot from the beginning of April until the climbing commences.

Although no direct prosecutions have been instituted by the Committee, they have upon a few occasions been able to influence the police to take action against offenders.

PAYMENTS FOR 1914.

	£	s.	d.
Wages, Hornsea	12	0	0
,, Spurn	12	0	0
Watchers' Travelling Expenses	1	4	3
Donation *re* Bempton Peregrines	1	0	0
,, *re* Stone Curlews	1	0	0
,, *re* Spurn	1	0	0
Secretary's Expenses and Sundries	0	10	0
Posters for Spurn	0	6	6
	£29	0	9
Balance in hand	16	17	1
	£45	17	10

RECEIPTS FOR 1914.

	£	s.	d.
The Right Hon. C. G. Milnes Gaskell	5	5	0
W. H. St. Quintin, Esq.	5	0	0
T. Waddington, Esq.	2	2	0
J. Atkinson, Esq.	1	1	0
H, B. Booth Esq.	1	1	0
Dr. R. S. Bishop	1	1	0
Leonard Gaunt, Esq.	1	0	0
Oxley Grabham, Esq.	1	1	0
G. T. Porritt, Esq.	1	1	0
E. W. Wade, Esq.	0	10	6
Johnson Wilkinson, Esq.	0	10	6
Elland Naturalists' Society	0	10	0
York Field Naturalists' Society	0	10	6
Digby Legard, Esq.	0	5	0

	£	s.	d.
W. H. Parkin, Esq.	0	5	0
S. H. Smith, Esq.	0	5	0
E. Wilfred Taylor, Esq.	0	5	0
	£21	13	6
Balance brought forward from 1913	24	4	4
	£45	17	10

MAMMALS, REPTILES, AMPHIBIANS AND FISHES COMMITTEE.—Mr. A. Whitaker writes:—Attention is drawn to the apparent scarcity of bats in the neighbourhood of Selby throughout the summer, by Mr. Musham. Elsewhere this does not seem to have been noticed, and in the Barnsley district they have been rather more plentiful than for several years past, and both Leisler's and Natterer's Bats have occurred among other more common species.

Mr. R. Fortune writes that the season for fresh water fish has been an exceptionally bad one owing to the lowness of the rivers. The most notable captures for 1914 were, Trout, 25½ inches long, 15 inches girth, weight 7 lbs. 5 oz., at Malton in May. Dace, 13¼ oz., at Pool in July. Flounder. 17 oz., at Newton-on-Ouse in July. Chub, 5 lbs. 1 oz., Forge Valley, and 5 lb. 2 oz. at Yedingham, both in March. Grayling, 1 lb. 13½ oz., 2 lb. 8 oz., 3 lb. 4 oz., at Ganton in March. Roach, 2 lb. 1 oz., at Yedingham in February. Barbel, two, 7 lbs. each, at Brafferton, and a Sturgeon, 9 feet long, weighing 230 lbs., near Goole on May 13th. Salmon fishing, owing to the absence of floods, has, generally speaking, been a failure.

Mr. Grabham, however, informs me that the netsmen took some particularly fine fish from the Ouse below York, but that the Smelt netting there in April was a complete failure.

Mr. Clarke records the capture of a species of fish of which he is aware of no previous records for our county, viz., the Electric Ray, about thirty inches long (*Torpedo mobiliana*), which was taken from the Salmon nets at Filey on the 29th of June.

Other interesting captures include the Lesser Forked-beard (*R. trifurcus*) and the Pearlside (*S. penmanti*). Mr. Clarke also draws attention to the unusual abundance of Porbeagle Sharks and Picked Dogfish.

CONCHOLOGICAL SECTION.

WEST RIDING.—Mr. Greevz Fysher, writes:—The exceptionally dry weather of the past season has been very unfavourable to the observation and collection of terrestrial mollusca, and cases have been observed where even fresh water species have

been practically exterminated by the drying up of the ponds or ditches they recently inhabited. Good work has been done at the meetings in comparison of exhibits and study of life history, structure, distribution, etc., based on Mr. Taylor's admirable papers. The district has been so exhaustively worked that little scope is left for the discovery of novelties, but records are kept well up to date which on the whole speak mainly of the disappearance of many of the rarer forms in certain areas, owing to the growth of the human population which destroys many habitats to make room for man, his industry and his dwellings.

East Riding.—Mr. J. F. Musham writes:—Attention has been drawn to the very late appearance in this district of *Helix aspersa*, L., the bulk of them being still in hibernation during the latter part of May.

Interesting spots for various species near Selby have been entirely wiped out during the last 12 months through building operations.

Marine Biology Committee.—The Rev. F. H. Woods, B.D., writes:—Excellent research work has been done by members at Filey at Whitsuntide, and at Whitby from September 18th to 22nd. A full account of the latter meeting will be found in the November issue of *The Naturalist*. It has been decided to hold the Annual Meeting for 1915 at Scarborough with the special object of investigating the North Shore.

ENTOMOLOGICAL SECTION.

Lepidoptera.—Mr. B. Morley writes:—The following notes apply more particularly to the S.W. Division. The early spring moths were decidedly scarce and sallow bloom only attracted common kinds. Spring larvæ were plentiful, *T. fimbria*, *B. repandata*, *A. agathina* and *N. xanthographa* especially so. In spite of this, few species have been abundant in the perfect stage, with the exception of *M. hastata*, *O. suspecta*, *P. gamma*, *C. soladiginis* and *H. elutata*.

"Sugar" although no great attraction during the whole season has never been quite a failure until the late autumn.

The three common white butterflies have appeared again in normal numbers, showing that they have quite recovered from the ill effects of wet seasons a few years ago.

Vanessa atalanta has again been abundant in late autumn and some *V. cardui* have been noted so fresh as to indicate local origin. *V. atalanta*, *cardui*, *io*, and *urticæ*, have all been seen in one field at Skelmanthorpe. The capture of a fine *S. convolvuli* at Cumberworth in August, constitutes a new record for the Skelmanthorpe district.

Attention must be especially drawn to the serious losses suffered by farmers through the attacks of *Plutella maculipennis* on the turnip crops. Many acres have been practically ruined by this pest. After the young plants were singled they began to assume a grey appearance in the foliage, and the roots developed "finger and toe." Swallows were noticed paying much attention to the little moths as they fluttered about late in the afternoons.

Melanism has not been a pronounced feature of the season. Dry years seem to arrest its progress.

A. grossulariata var. *varleyata* has again occurred in the Barnsley neighbourhood.

COLEOPTERA COMMITTEE.—Dr. W. J. Fordham writes:—Two of the members have been unable as yet to furnish lists of their captures owing to their specimens still being in the hands of specialists. The greater part of the collecting was done in the spring, when beetles were fairly abundant. Nine species have been added to the Yorkshire List during the year, viz.:—*Acupalpus exiguus* Dj. (type), *Anacœna bipustulata* Steph., *Ocyusa incrassata* Muls., *Philonthus splendidulus* Gr., *Cryptophagus pallidus*, Stm., *Bagous limosus* Gyll., *Sitones waterhousi* Walt., *Trypodendron quercus* Eich. and *Xyleborus dryographus* Ratz. In addition to the above there are eleven species to add which were taken in previous years, but not recorded, some of them having only recently been determined. They are *Laemostenus complanatus* Dj., *Cercyon depressus* Steph., *Tachyusa umbratica* Er., *Homalota triangulum* Kr., *Haploderus coelatus* Gr., *Silpha sinuata* F., *Cryptophagus saginatus* L., *Catops sericatus* Chand, *Aphodius granarius* L., *Cyphon nitidulus* Th. and *Galerucella pusilla* Weise.

Mr. E. G. Bayford has published an interesting note on a specimen of *Monochammus sartor* L., from West Yorkshire.

A full list will appear later.

HYMENOPTERA, DIPTERA AND HEMIPTERA COMMITTEE.—Mr. Rosse Butterfield writes:—An important list of Ichneumonidæ from Yorkshire and Lincolnshire by Professor J. W. Carr, of Nottingham, appeared in the March number of *The Naturalist*. Among the 24 Yorkshire species there enumerated several are additions to the County list. Mr. W. Denison Roebuck states that the Ichneumonid *Phycadeuon rusticellæ* has occurred in numbers in his room 259 Hyde Park Road, Leeds, during May and June, parasitic on the Moth *Tinea biselliella*. It is new to our Yorkshire List. Interesting observations on the occurrence or habits of bees and wasps have been made by Mr. H. Walsh at Halifax, and Mr. J. F. Musham, at Selby.

Andrena labialis Kirb. and A. *thoracica* Fab., were captured at Keighley by the writer. These have not hitherto been

recorded for the county. The members of this genus, together with their inquilines, are now fairly well represented.

Judging by the experience of correspondents the season does not appear to have proved favourable for Aculeates.

Two saw-flies and two ichneumons from near Keighley are new additions, while several species have been found in fresh localities.

A few additions have been made to Diptera, *Chrysotoxum arcuatum* L., being the most noteworthy. The season has not been unfavourable for the Syrphidæ generally.

The new species have been identified or confirmed by the Committee's referees to whom grateful thanks are due.

NEUROPTERA AND ORTHOPTERA.—Mr. G. T. Porritt writes:—The only items of interest relating to the Neuroptera of Yorkshire during the present season are the captures of *Taeniopteryx trifasciata* on the river at Knaresborough on April 11th and 13th, and of *Nemoura inconspicua* at Filey on June 1st, both common, and both new to the county. On August 8th I took *Hemerobius nervosus* in the old Black Fir wood at Farnley Tyas, Huddersfield, previously only recorded from the York district in our county.

In Orthoptera, Dr. H. H. Corbett sent me, on January 24th, a specimen of *Phyllodromia germanica* which he said was then swarming in a house at Doncaster.

ARACHNIDA.—Mr. W. Falconer writes:—The results of the season's work, though not so extensive as usual, are no less interesting and important than in previous years. Three species of spiders have been added to the county list: two—rare in Britain—by Mr. J. W. H. Harrison, *Cnephalocotes ambiguus* Camb. (communicated by the Rev. J. E. Hull), and *Ceratinella scabrosa* Camb., both sexes, in Cleveland; and one, which is, however, much commoner further south, by the Rev. R. A. Taylor, *Xysticus pini* Hahn., an adult♀, near Scarborough; while *Porrhomma egeria* Sim. ♀, Raincliff Woods (R.A.T.), a rare spider, is new to the North Riding; and *Lessertia dentichelis* Sim (*Coryphæus simplex* F.O.P.Cb.), Wrenthorpe (Mr. Johnstone), and *Araeoncus humilis* Bl. (W.F.), usually a common and widely distributed form, Thorner and Mirfield, are new to the West Riding.

The false-scorpion, *Chernes nodosus* Schr., has again been met with in Bradford on the cover of a book (Mr. A. Haigh-Lumby).

More attention has been given to mites, especially Oribatids, by Messrs. Harrison, Winter and myself, and several additions made to the list given in *The Naturalist* last March. These have been mainly identified by Dr. George and Rev. J. E. Hull, the latter also communicating the names of mites obtained

from material sent to him from Hawes by Mr. Jas. Smith, Borrowby, Thirsk.

The rare earth-mite, *Ottonia ramosa* George, has been met with on Cupwith Hill, Slaithwaite, and a form, *O. ignota*, new to science, from Holme Moss, was described and figured by Dr. George in *The Naturalist* for October, in which journal also during the year have appeared two papers with full data dealing with the Arachnida of Yorkshire (*vide* March and August issues).

BOTANICAL SECTION.

Mr. J. F. Robinson writes:—As early as Easter this year those interested in the Phanerogamic flora of Yorkshire had a good time at the well-attended Field Meetings at Knaresborough, where many of the early spring flowers were noted. The promise of spring in the cases of such as Blackthorn and Bullace has been well filled in fruitage this autumn. The meetings at Filey at Whitsuntide enabled the enthusiastic group of phanerogamists who met there to make very interesting and exhaustive investigations into the flora of Primrose Valley, now almost entirely denuded of *Primula acaulis* Linn., the Flat Cliff and the shore. The reports published in *The Naturalist* for July and August are evidence. Associated in a slight degree with the Filey Meeting may be mentioned the re-discovery near Hull of the rather uncommon sedge, *Carex axillaris* Good.

At Askrigg also, the botanists had a fine opportunity of doing good work among the more or less sub-montane forms of phanerogams. A month or two of very dry weather usually clears off completely such early flowering forms like *Thalaspi occitanum*, and failure to see this plant is scarcely to be wondered at. The same thing has been noticed in the case of *Draba Thaliana, Teesdalia nudicaulis*, etc. It is pleasing, however, to note that *Primula farinosa* and *Habenaria albida* are still frequent and were seen near Askrigg. A full report of the Eskdale excursions appeared in the October issue of *The Naturalist*.

Mr. C. A. Cheetham adds:—This summer has again been a dry one, but has not given the same results as last year.

The Hawthorn, Hazel and Mountain Ash are full of fruit whereas last year they were barren, and the Ash is now without the plenty of last year. This is not merely a local feature for in Donegal the same things were noted.

This year *Habenaria viridis* was sought unsuccessfully in a meadow which last year had it in quantity—the same remark may be made on *Epipactis palustris*, though in a less marked degree; these things are well-known to field workers, but the reasons are left unexplained just as the plant associations of the ecologist were known but never recorded and causes enquired into until the new study brought our laboratories into touch

with the plants in their homes. If we can get statistics and records ready for future enquirers we shall have accomplished some good work.

Botanical Survey Committee.—Dr. T. W. Woodhead writes:—Considerable attention has again been paid to the vegetation features of the districts visited during the excursions of the Union. Of especial interest was the vegetation of the dry valleys of the Wolds noted during the Filey excursion at Whitsuntide. It is hoped that a detailed study of these valleys will be made, as they promised several features of interest. The most important work done during the year is the study of the ecology and life history of *Molinia cærulea* by the Rev. T. A. Jefferies. The distribution of this species and its associates have been carefully worked out on the Slaithwaite Moors near Huddersfield, and it is hoped that the results, which are of much value will shortly be published. Incidental to this investigation was the discovery of great numbers of galls on the stems of Molinia caused by the gall-midge, *Oligotrophus ventricolus*, an insect new to Yorkshire; described in *The Naturalist* for November.

Bryological Committee—Mr. Wm. Ingham, B.A., writes:—At the meeting of the Bryological Committee at Plumpton Rocks the moss, *Orthodontium gracile* was found in abundance on vertical rocks, also *Cynodontium Bruntoni*, and the rare Hepatic, *Sphenolobus exsectæformis*.

At the Y.N.U. Meeting at Knaresborough were found *Plagithecium latebricola* and *Barbula tophacea* var. *acutifolia*.

At the Meeting at Askrigg, *Hypnum chrysophyllum* var. *erectum* was found on Addlebrough, *Hypnum vernicosum* in abundance by Semmerwater, *Seligeria pusilla* and the hepatic, *Cololejeunea calcarea* in Whitfield Gill.

At the Meeting at Middleton-in-Teesdale, in May, 1910, the second Brit. habitat for *Hypnum fluitans* var. *Robertsiæ* was found, the moss being examined and determined in 1914.

Mr. J. J. Marshall has done further good work in the bryologically neglected county of Lincolnshire. He has added the following to V.C. 54, *Dicranum undulatum*, *Pleuridium subulatum*, *Tortula muralis* var. *rupestris*, *Bryum atropurpureum* var. *gracilentum*, *Thuidium Philiberti*, *Eurhynchium speciosum*, and the rare Hepatic, *Ptilidium pulcherrimum*.

Mycological Committee.—Mr. C. Crossland writes:—The report of the twenty-fifth Annual Meeting and Foray of the Mycological Section will be found, with all particulars, in *The Naturalist* for January, pp. 12-16.

The seventh supplementary list of recently discovered Yorkshire Fungi since the publication of the 'Yorkshire Fungus Flora' appears in *The Naturalist* for May, pp. 145-150.

A summary of the work done by the Committee in the Lythe, Mulgrave and Sandsend district, 1894, 1900, 1908, 1910, 1911, 1912 and 1913 appeared in the February issue, pp. 60-65. The results are tabulated on page 64, and show that 1,245 species have been noted in that small area alone.

A report of the unofficial foray held by the Committee last June in same district, appears in the August issue, and shows a further addition of 22 species, of which, it will be seen, 12 are new to Yorkshire, 2 being additions to the British Flora.

Investigations were continued at the annual foray, held October 3rd to 8th, in the same woods, when 37 still further additions were made, 8 being new to Yorkshire, one of which is new to Britain. Fuller particulars will appear in a detailed report of the foray.

Mr. Roe, Scarborough, reported good work done at the Filey excursion, including a new Yorkshire species (*The Naturalist* August, p. 25).

Miss C. A. Cooper represented the Committee at the Knaresborough Excursion (*See The Naturalist*, June, p. 181).

At the Sleights Excursion Miss Cooper and Mr. A. E. Peck had charge of the Mycology. The results were most successful, there being several additions to the county flora (For Report *see The Naturalist*, pp. 319-322).

Among the good things found about Scarborough by Mr. Peck was a fine specimen of *Inocybe rhodiola*, having only one previous record for the British Isles. He has also met with the somewhat rare *Spathularia clavata*.

GEOLOGICAL SECTION.

Messrs. J. Holmes and C. Bradshaw report :—The Section was officially represented at all the excursions and the attendance was on the whole satisfactory, opportunities for practical work being possible on each occasion.

KNARESBOROUGH.—In the gorge of the river Nidd between the town and Grimbalds' Crag sections of Magnesian Limestone unconformable to Millstone Grit were examined. At Plumpton Rocks, pebbles in the grits and false bedding structure were noted, while the drift which overlies the Permian strata of the Nidd Valley afforded a subject for discussion.

FILEY.—The coast sections between Filey Brig and Cayton Bay were carefully explored, and characteristic fossils from the Calcareous Grit and Gristhorpe plant-bed were obtained. On the hard rock underlying the Boulder Clay of Carr Naze, glacial striæ were seen, and instances of 'terminal curvature' detected. Shap granite and Brockram were among the travelled rocks collected. An inland excursion to the Wolds, south of the Vale

of Pickering, proved very successful. Near Flixton the party stayed some time to work at a section showing the Black Marls which divide the Middle from the Lower Chalk. Afterwards a ramble of four miles or so along a winding chalk valley was greatly enjoyed, especially so by many of those who for the time first made their acquaintance with typical Wold country.

Askrigg.—In Whitfield Gill and neighbouring ravines, geologists saw the sections which eighty years ago Phillips adopted as a standard of reference for the Yoredales of the Carboniferous system, while between Bainbridge and the top of Addleborough, a complete sequence from the 'Great Scar' to the 'Underset' Limestone could be studied. Splendid views were obtained from Addleborough and Stake Fell. Semmerwater, which adds so much to the scenic charm of the district, was probably formed by a lateral moraine of the Wensleydale glacier damming up the outlet of the tributary valley.

Sleights for Eskdale.—Lias Alum shales were inspected, but as the main attraction of this excursion was glacial geology, the picturesque valley of the Esk in the neighbourhood of Glaisdale Egton and Little Beck was explored with that object in view.

Jurassic Flora Committee.—Mr. J. J. Burton writes:—During the year now ending the work has been chiefly amongst the *Thinnfeldia* and *Nilssonia* beds at Roseberry Topping, and in the main escarpment to the East. A number of fresh localities have been tried but no new forms have been observed. There is a rather promising bed on the Eston escarpment which will in the near future be more carefully worked. Such evidence as has been obtained seems to indicate that the plants grew in colonies and that there was a predominance of particular species in each locality. An immense quantity of material has been accumulated and is now at Cambridge undergoing identification. and classification, and until this work has been accomplished it is proposed to devote more time to the discovery of new deposits than to collecting.

Glacial Committee.—Mr. J. J. Burton, F.G.S., writes:—'The great landslip on Roseberry Topping has brought down many blocks of sandstone with well marked glacial striæ. The altitude from which they have been brought down is uncertain. I observed them in the moving mass of debris of about 750-770 feet. Most of them have again been covered up. One remains in situ having merely had the cover of surface soil removed.

Mr. G. Sheppard, F.G.S., in *The Naturalist* for July, describes and illustrates a fault which he recently observed in the Glacial Beds at Dimlington on the Holderness Coast. In his opinion the evidence shows that the dislocation took place when the whole mass was frozen.

Mr. C. T. Trechmann, B.Sc., F.G.S., read a paper on May 21st, 1914, before the Geological Society of London, entitled 'The Scandinavian Drift of the Durham Coast and the General Glaciology of South East Durham." This paper is of great interest to Yorkshire Glacialists. For particulars see *The Naturalist*, July, 1914, page 204.

At the Whitsuntide Meeting of the Yorkshire Naturalists Union held at Filey, there was an interesting discussion as to the position of the buried channel which drained the Vale of Pickering in pre-glacial times. For particulars see *The Naturalist* for July, page 223.

Coast Erosion Committee.—In last year's report, Mr. J. T. Sewell, J.P., of Whitby, had some interesting notes on the erosion of the Coast line between Whitby and Sandsend.

Mr. Sewell subsequently published a short paper entitled, 'Coast Erosion at Whitby,' in *The Naturalist* for April. This paper is illustrated, and contains much additional information.

Micro-Botany and Micro-Zoology Committee.—Mr. J. W. H. Johnson, B.Sc., F.L.S., writes:—The Section deeply regrets to record the death of its Chairman; his reputation as a pioneer in algology is world-wide, and the loss sustained by the whole botanical world is indeed great, but it is especially keenly felt by this Section.

At the recent visit of the Union to Sleights, the rare alga *Vaucheria synandra* was identified from the Ruswarp cars, which also contains many *marine* diatoms. Near the road-side at Sleights *Spirogyra calospora* Cleve was obtained, both these are I believe, new Yorkshire alga records.

During the last few years considerable attention has been given to the microscopic life in our rivers and streams, especially the fungi and algæ. As a result; the following list of additions to our local flora has been made, in many cases the organism is apparently new to Britain. In the process of identification by subculture, higher forms have often occurred and these have been included.

**Zooglæa ramigera* Itzshn.—River Wharfe at Ilkley; River Calder at Cooper Bridge and Balne Beck, Wakefield; Kirkhammerton; besides the type the following varieties have been noticed, *compacta*, *carnea* and *ura*.

Sphærotilus natans Kütz.—Common in most rivers and streams and also in warm effluents from trade premises of W. Yorkshire.

Cladothrix dichotoma Cohn.—River Calder, Wakefield, Coxley Beck, Balne Beck, Blackburn Brook, Kirkhammerton and

Bishop Monkton; River Wharfe in plankton between Otley and Pool.

! *Gallionella ferruginea* Ehr.—Strensall Common.

Chlamydothrix ochracea (Mig) Kütz.—Of frequent occurrence in waters as an ochrey filamentous deposit.

**Clonothrix fusca* Roze.—Balne Beck, Wakefield. (*C. gracillima* W. & G. S. West, has already in the Alga-Flora of Yorks., p. 148).

**Thiothrix nivea* (Vauch) Win.—Calder and Hebble Canal at Horbury; Cooper Bridge; River Aire at Leeds; Balne Beck, Wakefield.

Beggiatoa alba (Vauch) Trev.—Frequent in polluted waters, also in sulphur waters, *e.g.*, drinking trough near bridge at Knaresbrough.

**Beggiatoa leptomitiformis* (Menegh) Trev.—In borehole water Bradford; Balne Beck. Wakefield.

**Chromatium okenii* (Ehr.) Perty.—A purple, sulphur bacterium, Baildon; Cooper Bridge. Abundant in Grimston Park, Tadcaster.

§ *Hillhousia mirabilis* G. S. West, and v. *palustris* G. S. West. —The type has only recently been described and is entirely new to science; the variety was obtained from a pond near Thornhill and is the only record.

Fusarium aurantiacum Sacc.—Warley, near Halifax.

Sporotrichum lanatum Wallr.—Greetland, near Halifax, *Nat.*, 1911, p. 166.

**Mucor circinelloides* Van Tiegh.—Frequently develops in subcultures of aquatic fungi.

**Acremonium spicatum* Bon.—Developed on culture plates. *Nat.*, 1911, p. 166.

Dematium pullulans de B.—Developed on culture plates.

**Aspergillus fumigatus* Fres.—Developed on culture plates.

Aspergillus niger Van Tiegh.—Readily develops in cultures infected from dark patches in dates and figs. *Nat.*, 1909, p. 221.

Aspergillus griseus Lk.—Identified by C. Crossland on culture plate. *Naturalist*, 1909, p. 221.

**Sachsia suareolens* Lind.—On culture plates.

Monilia variabilis Lind.

Leptomitus lacteus Ag.—R. Don, at Ickles Bridge; River Nidd at Knaresbrough.

Thamnidium elegans Lk.—On culture plates.

Saprolegnia sp. ?—Attacked fish in Lake, Thornes House, Wakefield.

Oospora lactis Sacc.—Very frequent, first noticed in River Aire at Apperley Bridge, March 1908.

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‡ *Oscillatoria formosa* Bory.—Balne Beck, Wakefield.

Euglena deses Ehr.—Of frequent occurrence, Frizinghall; Balby near Doncaster.

‡*Amphiprora paludosa* W. Sm.—See *Naturalist*, pp. 353-360, 1911.

Nitzschia paradoxa (Gmel.) Grun.—Balne Beck, Wakefield.

‖*Spirogyra calospora* Cleeve.—Roadside, near Sleights.

† *Richteriella botryoides* (Schm.) Lemm. and var. *fenestrata* Schdr.—Otley, very plentiful.

‖ *Vaucheria synandra*.—Ruswarp Carrs, Whitby.

Mr. H. Moore supplies the following list of rotifers, etc., from Trecton and Maltby Common :—

Anuræa aculeata
,, *cochlearis.*
Asplanchna priodonta.
Brachionus pala.
,, *rubens.*
Conochilus volvox.
Dinocharis pocillum.
Notholea acuminata.
Nommata aurita.
Saculus viridis.
Synchaeta pectinata.
,, *tremula.*
Arcella vulgaris.
Coleps hirtus.
Synura uvella.
Uroglena volvox } in great
Volvox globator } profusion.

Mr. M. H. Stiles adds Wheatley Brick Ponds, nr. Doncaster, as a new locality for Volvox.

The Affiliated Societies.—The number of these Societies is now thirty-nine, having a total membership of 3,370.

Two Societies became affiliated during the year and two have ceased to exist.

The Membership of the Union.—At the end of 1913 the membership numbered 376. Twenty-three members have been elected. Resignations and deaths have been 22, leaving a total membership of 377.

The following are the newly elected members :—

Miss Catherine E. Andrews, 19 Lee View, Hebden Bridge.
Mr. Harry Bendorf, 19 Brundretts Road, Chorlton-cum-Hardy, Manchester.
Mr. J. C. Boden, The Grove, Ilkley.
Mr. Wm. Holmes Burrell, F.L.S., 1 Strattan Street, Leeds.
Mr. W. A. Durnford, M.B.O.U., Elsecar, Barnsley.
Mr. Harold A. Dale, School House, Askrigg.
Mr. Walter Greaves, 1 Chapel Avenue, Hebden Bridge.

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* New to Britain. † Only previous record for British Isles—Lough Beg, Ireland. ‡ West Riding additions only. § New variety. ‖ New to Yorks. ! Previously recorded for Scotland only.

Major J. Greenwood, 1 Bartram's Park, Haverstock Hill, London, N.W.
Mr. J. H. Gough, Ph.C., 4 Woodland Grove, Newton Road, Leeds.
Mr. Ward Jackson, 11 South View Terrace, Silsden, Keighley.
Mr. Geoffrey Laughton, 30 Louis Street, Chapeltown Road, Leeds.
Miss Ivy Massee, Gateacre, Sandycombe Road, Kew Gardens, Surrey.
Mr. C. W. Mason, 78 Beverley Road, Hull.
Miss Margery Mellish, Stonebridge Lower House, Wortley, Leeds.
Mr. George Mitchell, "Upwood," Bingley.
Mr. M. C. Morris, 18 Mount Parade, York.
Rev. W. Pearson, Spofforth Vicarage, near Harrogate.
Mr. J. H. Skelton, Stow Park, Lincoln.
Mr. Herbert J. Sharp, 'Kenilworth,' Avenue Road, Doncaster.
Mr. Frederick White, Registrar, Cemetery House, Keighley.
Mr. Herbert J. Williamson, 6 Oakburn Road, Ilkley.
Mr. C. J. Walker, Pyenot Hall, Cleckheaton.
Rev. W. K. Wyley, The Vicarage, Aysgarth.
Keighley Naturalists' Society.
Whitby and District Field Naturalists' Club.

TRANSACTIONS.—Part 35 (New Miscellaneous Series, No. 3), has just been issued to members. We are indebted to our past Presidents, Mr. W. D. Roebuck and Mr. J. W. Taylor, for generous donations towards the cost of their addresses; and Mr. Thomas Sheppard for the List of Members to March, 1912.

SOPPITT MEMORIAL LIBRARY.—Dr. T. W. Woodhead reports:—We are indebted to Mr. Percy H. Grimshaw, of the Edinburgh Natural History Museum, for a donation to the library of 25 of his papers on Insects. These include, 'Diptera of Orkney and Shetland,' 'Forth District' (3), 'Perthshire,' 'Inverness-shire,' 'St. Kilda,' 'West of Scotland,' 'Flannan Islands,' 'Fair Isle,' 'Clare Island,' 'Lincolnshire,' 'British Hydroids' (3), 'Insect Fauna of Isle of May,' 'Grouse Moors,' 'Heather Beetle,' and two papers dealing with type specimens of Lepidoptera and Coleoptera in the British Museum. Mr. Chas. Crossland has presented copies of his 'Halifax Bibliography and Fungi in Yorkshire.'

BRITISH ASSOCIATION.—Mr. T. Sheppard reports that he attended the Conference of Delegates from the Corresponding Societies of the British Association, held in Havre in conjunction

with L'Association Française pour L'Avancement des Sciences, from July 27th to August 2nd. A notice of the meeting has already appeared in *The Naturalist* for September, and in the October number of the same journal Mr. John Hopkinson's paper on the 'Publications of Local Scientific Societies,' which was there read, and discussed is given almost *in extenso*.

'The Naturalist.'—During the past year *The Naturalist* has well maintained its reputation as a high-class scientific journal. Many articles by members of the Union have appeared in which important results of original investigations have been recorded. These have covered a wide range of subjects and will be found of inestimable benefit to members of the Union, as well as to others who may be interested in pursuing studies in the various branches of natural history which have thus been dealt with. As the official organ of the Union, this chronicle of the proceedings and investigations during the excursions to different portions of the County will prove of permanent value, and will be referred to in the future as a basis on which additional work will be built. The skilful discrimination with which excerpts from other Scientific publications have been introduced adds much to the interest and value of the journal.

The Presidency.—The Presidency for 1915 has been offered to and accepted by Mr. Riley Fortune, F.Z.S., Harrogate.

The Union wishes to place on record its great indebtedness to the retiring President, Mr. Thomas Sheppard, F.G.S., F.S.A. (Scot.), for his sterling services in connection with the Union during the year, and also for his attendance at the excursions and sectional gatherings, which have been greatly appreciated.

Financial Statement.—The following is the Hon. Treasurer's (Mr. Edwin Hawkesworth), Statement of Receipts and Payments :—

It is very satisfactory to have to report that this year's income has been sufficient not only to pay all expenses, but to clear off the remainder of the deficit, and have a cash balance in hand. It is many years since the Union was in such a sound financial position.

INCOME AND EXPENDITURE STATEMENT, 12 months to November 24, 1914.

INCOME.

	£ s. d.	£ s. d.
Members' Annual Subscriptions, arrears	8 19 0	
,, 1914	97 6 0	
,, 1915	1 13 0	
		107 18 0
Levies from Associated Societies, arrears	3 4 4	
,, 1914	11 13 7	
		14 17 11
Sales of Publications—		
West's 'Alga Flora'	0 6 2	
Baker's 'North Yorkshire'	0 11 3	
Porritt's 'Lepidoptera'	0 9 8	
Circulars	0 4 2	
		1 11 3
Bank Interest		2 0 3
'Naturalist'—		
Subscriptions, arrears	6 15 0	
,, 1914	82 6 6	
,, 1015	1 10 0	
	90 11 6	
Recognition fee	5 0 0	
Discount	2 16 8	
		98 8 2
		£224 15 7

EXPENDITURE.

	£ s. d.	£ s. d.
Expenses of Meetings		6 2 7
Printing and Stationery (General A/c)		18 2 6
Postages, etc. (Hon. Secretaries' A/c)		13 1 8
Clerkage, ,, ,,		10 0 0
Printing and Stationery (Hon. Treasurer's Account)		0 18 9
Postages etc., ,,		2 1 4
Wreath (Mr. Wm. West)		1 1 0
Cost of Publications:—		
Annual Report, 1913 ..	£6 1 6	
,, ,, 1914 (est.)	6 0 0	
	12 1 6	
Less—Provision in A/cs for 1913	6 0 0	
	6 1 6	
Transactions	1 5 0	
		7 6 6
'Naturalist'		
Subscribers' Copies ..	£96 5 5	
Life Members' Copies	6 10 0	
Exchanges	3 3 4	
Sundries	1 5 0	
Editor's Postages, etc.	8 15 2	
Extra pages	1 18 0	
		117 16 11
Balance, being excess of Income over Expenditure during 1914		48 4 4
		£224 15 7

BALANCE SHEET, November 24, 1914.

LIABILITIES.

	£ s. d.	£ s. d.
Amounts due from Union—		
'Naturalist'		58 10 7
Annual Report, 1914		6 0 0
Subscriptions received in advance ..		3 3 0
Life Members' Account		53 5 0
'Hey' Legacy Account		20 0 0
Balance, being excess of Assets over Liabilities, Nov. 24th, 1914 ..		40 6 0
		£181 4 7

ASSETS.

	£ s. d.	£ s. d.
Cash at Bank	159 8 3	
Cash in Hon. Secretary's hands	4 12 6	
Cash in Hon. Treasurer's hands	5 13 3	
	169 14 0	
Less: Cash due to Hon. Editor	1 2 3	
		168 11 9
Subscriptions in Arrears ..	22 12 10	
Less: Amount written off as unrealisable ..	10 0 0	
		12 12 10
		£181 4 7

Audited and found correct,
Nov. 27th, 1914.

WALTER GARSTANG,
ALBERT GILLIGAN.

E. HAWKESWORTH,
Hon. Treasurer.

Printed at BROWNS' SAVILE PRESS, 40, George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
January 1st, 1915.

FEBRUARY 1915. No. 697
(No. 474 of current series)

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, F.G.S., F.R.G.S., F.S.A.Scot.,
THE MUSEUMS, HULL;
AND
T. W. WOODHEAD, Ph.D., F.L.S.,
TECHNICAL COLLEGE, HUDDERSFIELD.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

J. GILBERT BAKER, F.R.S. F.L.S., GEO. T. PORRITT, F.L.S., F.E.S.
Prof. P. F. KENDALL, M.Sc., F.G.S., JOHN W. TAYLOR,
T. H. NELSON, M.B.O.U., RILEY FORTUNE, F.Z.S.

Contents :—

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Prepaid Subscription 6/6 per annum, post free.

YORKSHIRE NATURALISTS' UNION.
VERTEBRATE SECTION.

President of the Section: E. W. WADE, Esq., M.B.O.U.

Two Meetings will be held in Room C7 at the Leeds Institute, Leeds, at 3-15 p.m. and 6-30 p.m. repectively, on Saturday, February 20th, 1915.

BUSINESS :—

To appoint Bird Watchers for 1915, and discussion upon other matters in connection with the Yorkshire Wild Birds' and Eggs' Protection Acts' Committee.

Papers (mostly illustrated by lantern slides or specimens) will be given as follows :—

"Notes on St. Kilda," Mr. E. W. Wade, M.B.O.U.
"Notes on the Ruff and Reeve," Mr. G. A. Booth, F.Z.S., F.E.S., M.B.O.U.
"Notes on Yorkshire Bird Life," Mr. T. H. Nelson, M.B.O.U.
"The Bats of Upper Wharfedale and Upper Airedale," Mr. H. B. Booth, F.Z.S., M.B.O.U.

and others, particulars not yet to hand.

Any Member or Associate of the Yorkshire Naturalists' Union is invited to attend and to bring notes, specimens, lantern slides, etc., and is requested to bring forward matters of interest connected with the work of the Section, and to take part in any discussion.

Will officials of Affiliated Societies kindly notify their members ?

Any further particulars from

A. HAIGH-LUMBY (*Hon. Sec.*),
Nab Drive, Shipley.

YORKSHIRE BRYOLOGICAL COMMITTEE.

There will be an Excursion to Castle Howard on Saturday, 20th February, to investigate a district rich in bryophytes. The train leaves York at 10 a.m. and reaches Castle Howard at 10-23 a.m. All members of the Yorkshire Naturalists' Union wishing to attend are welcome.

WM. INGHAM.

BOOKS WANTED.

The Naturalist (? stylographed). York. 1823.
The British Naturalist. Vol. IV. 1894.
The Field Naturalist and Scientific Record. Set.
The Journal of the Keighley Naturalists' Society. Set.
Huddersfield Arch. and Topog. Society. 4 Reports. (1865-1869).
Reports, Malton Naturalists' Society. Set.
The Naturalists' Journal. Parts 1-18.
Monthly Circular, Huddersfield Naturalists' Society. Nos. 9, 10, 11, 12, 15, 16, 17, 20.
First Report, Goole Scientific Society.
Cleveland Lit. & Phil. Society's Transactions. Science Section or others.
The Naturalists' Record. Set.
The Natural History Teacher (Huddersfield). Vols. I.-II.
The Economic Naturalist (Huddersfield). Vol. I.
The Naturalists' Guide (Huddersfield). Set.
The Naturalists' Almanac (Huddersfield). 1876.
Proc. Yorkshire Naturalists' Club (York). 1867-70. (Set).
Keeping's Handbook to Natural History Collections (York).
"Ripon Spurs," by Keslington.

Apply :—**Editor, The Museum, Hull.**

NOTES AND COMMENTS.

A HISTORY OF BRITISH MAMMALS.

Part XVI. of this fine work has recently been published.* It deals with the Orkney Grass Mouse; Locally Extinct Voles; The British Water Rats; The South British Water Rats; and Black Water Rats. The different named forms and varieties into which these small mammals are now being divided, renders their study and identification a matter of some difficulty, and unless care is exercised, the tendency seems to be to define varieties on rather slender evidence. However, "British Mammals" cannot be said to be guilty of hurried or careless handling of the subject. There are several illustrations, including an excellently coloured plate of of skins *Microtus hirtus, M. agrestis neglectus, M. orcadensis* and *M. agrestis exul.*

LANCASHIRE AND CHESHIRE ENTOMOLOGISTS.

The thirty-seventh Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society are to hand.† Besides the rules, list of members, etc., there are summaries of papers read, a note on *Tortrix costana* vars. *liverana* and *intermedia*, by W. Mansbridge; the President's address on 'Hairs and Scales of Lepidoptera,' by F. N. Pierce; and eighteen pages of 'The Lepidopterous Fauna of Lancashire and Cheshire,' compiled by W. Mansbridge, 'being a new edition of Dr. Ellis's list.' There is a portait of Mr. J. Cotton; and a plate of the new varieties of *T. costana*, and of lepidopterous hairs, etc. We would like to suggest to the editor the necessity of adhering to the rule that specific names should commence with small letters; especially in the case of new varieties; the large capitals in the heading on page 18 look particularly aggressive, besides being inaccurate. By the way, in Mr. Mansbridge's 'New Edition of Dr. Ellis's list' no reference whatever is made to the fact that the list was originally published in *The Naturalist*, and that even in 'publications quoted' no mention is made of this journal. We trust that the omission is merely accidental. In an ordinary course we should have thought that before anyone printed a 'new edition' of a list appearing in a scientific publication, the necessary permission would have been obtained, if only as an act of courtesy.

THE BRADFORD ANTIQUARY.

Part XVII. of the new series of this journal has been published, and gives evidence of the continued work and interest of the Bradford Historical and Antiquarian Society. Besides short notes, it contains a paper on 'Broughton Hall

* Gurney and Jackson, 2/6.
† xxv. + 18 pp., 3/6.

and its Associations,' by Eleanor B. Tempest; an interesting account of 'Three Ancient Crosses near Keighley,' by J. J. Brigg and F. Villey; 'The Roman Road North-westwards, from Bradford or its neighbourhood,' by F. Villey; and 'Notes on the Re-building of Some Aire and Calder Bridges in the reigns of Elizabeth and James I.,' by W. E. Preston. Mr. T. T. Empsall continues 'The Transcript of the Marriage Registers of Bradford,' but we cannot find the 'page 33' referred to in the 'contents.' The publication is illustrated by plans and blocks from photographs.

TAYLOR'S MONOGRAPH OF MOLLUSCA.

We should like to congratulate Mr. J. W. Taylor on the completion of the third volume of his valuable monograph of the Land and Freshwater Mollusca of the British Isles. This was accomplished with the issue of Part 21* on December 21st. This volume deals with the Zonitidæ, Endodontidæ and Helicidæ, it occupies over 500 pages, and contains thirty-five plates as well as several illustrations in the text. Our readers are familiar with the excellent nature of these plates, as we recently had the pleasure of reproducing one.

HUDDERSFIELD NATURALISTS.

The Annual Reports and Balance Sheets of *The Huddersfield Naturalist and Photographic Society* for 1913-14 have been published (12 pp.) They include the 'Natural History Report,' by Mr. C. Mosley, who is also responsible for 'Entomology'; Mr. A. C. Ellis writes the 'Photographic Report'; Mr. J. H. Carter reports for the 'Antiquarian Section,' including an account of the excavations at Slack; Mr. E. Fisher reports for 'Ornithology'; Mr. W. E. L. Wattam for 'Phanerogamic Botany; and Mr. J. W. H. Johnson for 'Cryptogamic Botany'; and there is a brief note on 'Geology,' by Dr. T. W. Woodhead. The Balance Sheet shows a 'gain on the year's working' of £4 12s. 11d.

YORKSHIRE NATURALISTS.

Part 35 of the Transactions of the Yorkshire Naturalists' Union (New Miscellaneous Series No. 3) has recently been published. It contains a reprint of Mr. W. Denison Roebuck's Presidential Address delivered at Sheffield on January 29th 1904, on 'Salient Features in the History of the Union'; a reprint of Mr. J. W. Taylor's Presidential Address delivered at Hull in 1912, on 'Dominancy in Nature,' with many coloured maps, etc.; a list of members corrected up to March, 1912, and reprints of excursion programmes from May, 1909 to December, 1914 (Nos. 215-255).

* pp. viii. + 481—552, 7/6

LEEDS GEOLOGISTS.

Under the editorship of Mr. E. Hawkesworth, part XVII. of the Transactions of the Leeds Geological Association has appeared, for 1911-13 (50 pp., 2/-). Besides reports of the Society's excursions and meetings, there are papers on 'Petrological Characteristics of Underclays,' by Miss S. E. Chapman; 'The Ammonites of the Lias (abstract),' by Mr. C. Thompson; and 'Evidences of Climatic Changes in Geological Times' (abstract), by Prof. P. F. Kendall. Messrs. A. Burnett and J. H. Everett give some detailed 'Notes on Sections

Robin Hood Quarry, looking east, showing Haigh Moor Coal.

in a Quarry at Robin Hood, near Leeds,' illustrated by photographs and diagrams. One of these we are kindly permitted to reproduce. The Leeds Society is to be congratulated on the valuable nature of its publication.

LEEDS ASTRONOMERS.

No. 21 of the Journal and Transactions of the Leeds Astronomical Society, edited by C. T. Whitmell (106 pp., 2/-), has been published. It contains some interesting notes by the Editor; some notes on 'Leap Year,' by S. Thorp; 'The Spectroscope,' by P. McC. Wilson; 'Telescopic Aperture and Light Grasp,' and 'The Closing of the Mouth of the Reflecting Telescope,' by D. Booth; 'The History of Astronomy,'

E. Hawks; 'Uranus as a View Point,' by C. T. Whitmell; 'Are Faith and Science Enemies?' by Louisa Tranmar; and 'The Work of the Society, 1913,' by the editor. Altogether it is a very creditable production.

LIVERPOOL GEOLOGISTS.

Mr. E. Montag edited part 1 of volume XII. of the Proceedings of the Liverpool Geological Society, recently published. The publication includes the Presidential Address of Mr. C. B. Travis, which deals with 'Some Evidences of Peneplanation

Natural Casts of Rhyncosauroid Footprints from Runcorn Hill.

in the British Isles'; 'A Description of a Footprint recently found in the Lower Keuper of Runcorn,' by Mr. H. C. Beasley, who also describes and figures some fossils from the Keuper at Alton, Staffordshire; Mr. F. T. Maidwell describes some sections in the Keuper of Runcorn Hill, and also some Footprints from the Keuper; Mr. W. T. Walker gives 'Some Observations on the Liassic Outcrop near Whitchurch (Shrop-

shire).' There is a strong 'footprint' flavour about the publication as, indeed, there should be. One of the illustrations we are kindly permitted to give for our members.

EAST ANGLIAN PRE-HISTORIANS.

The Proceedings of the Pre-historic Society of East Anglia for 1913-14, conclude the first volume, and contain pages 385-491 and numerous plates. In view of the small subscription to the society the publication is remarkably large, and contains a great variety of papers more or less bearing upon the Society's work as defined by its title. Much seems to be made of the scratchings and other microscopic characters of flint flakes; in some cases far too much we fear. Personally we agree with Colonel Underwood that 'what have been looked upon as deep glacial striæ may be simply weathered out scratches, the initial stage of which did not require very much pressure to produce.' We congratulate the editor, Mr. W. G. Clarke, for his efforts in preventing the proceedings being quite a 'one man' show.

BELFAST NATURALISTS.

The Annual Report and Proceedings of the Belfast Naturalists' Field Club (N.S. Vol. 7, pt. 1), contain a record of the recent jubilee meeting of the Belfast Society. There is also an account of the Club's meetings and records. The Presidential Address of the Rev. Canon Lett is 'A Chat about Linné'; Mr. G. Livens refers to 'Plants in Relation to their Surroundings'; 'The History of Irish Woods and Trees,' by Mr. A. Henry; 'How to recognise our Common Wood Lice,' by Mr. N. H. Foster; and the 'History of the Rosapenna Sandhills,' by Mr. R. J Welch. Mr. Waterhouse also gives his report on the Birmingham meeting of the British Association.

THE SOUTH EASTERN NATURALIST.

Under this heading have been published the Transactions of the South-Eastern Union of Scientific Societies, for 1914 (cxxiv. + 83 pp.). The first section is devoted to an elaborate report of the Nineteenth Annual Conference held at Bournemouth, and the second to the papers etc., presented; the publication being edited by Dr. William Martin. Among the items printed are the presidential address of Dr. Chalmers Mitchell, on 'Science and Life'; 'Vegetation of the Bournemouth District,' by Mr. W. M. Rankin; 'The Scenery of Bournemouth and its Geological History,' by Dr. W. T. Ord; 'Flora of the New Forest,' by the Rev. J. E. Kelsall; 'Applied Science and the Patent System,' by Mr. A. F. Ravenshear; 'Problems in Coast Erosion,' by Mr. E. A. Martin; and 'The Alum Trade in the 15th and 16th centuries, and the beginnings of the Alum Industry in England,' by Mr. Rhys Jenkins; the last two items have a distinctly Yorkshire interest.

THE NEWCASTLE MUSEUM.

The Report of the Natural History Society of Northumberland, Durham and Newcastle-upon-Tyne is more favourable than usual. Through the efforts of Mr. N. H. Martin subscriptions amounting to over £3,700 have been raised towards an endowment for the purpose of the Museum. £25,000 is the amount required. The Curator still complains of being short-staffed, and gives particulars of the work that might be done if he had more help. A list of donations to the Museum accompanies the report.

ANTARCTIC FOSSIL PLANTS.

The Trustees of the British Museum have undertaken the publication of the natural history results of the British Antarctic ('Terra Nova') Expedition, 1910, sent out under the command of the late Captain Scott. It is proposed to issue the memoirs as they become ready for publication, and thus delay in publication is avoided. The first of the geological Memoirs to be completed is an account of the Antarctic Fossil Plants,* which is the work of Prof. A. C. Seward.

A GLOSSOPTERIS FLORA IN THE ANTARCTIC.

There are many useful pieces of information in this Memoir. The discovery of a *Glossopteris* flora in South Victoria Land, for instance, suggests interesting geological problems. Griffith Taylor has called attention to resemblances between the eastern side of Australia and Victoria Land, and in the structure of South Africa there are points of contact with the polar areas. Prof. Seward certainly adds a valuable chapter to our knowledge of palæobotany, thanks to the efforts of the heroes of the Antarctic.

WEALDEN FLORAS.

In the *Hastings and East Sussex Naturalist* (Vol. 2, No. 3), Prof. A. C. Seward has a valuable paper under this head. He shows that 'a comparison of the floras of Japan, South Africa, North and South America, Europe and the Arctic regions reveals a surprising resemblance in the general facies of the vegetation and demonstrates the relative abundance of cosmopolitan types. There were no doubt local differences in the composition of the floras, but these were much less marked than in equally distant countries at the present day. Another interesting fact is that a considerable number of the European species are most closely related to plants now characteristic of tropical and sub-tropical regions. With these were associated Equisetaceous plants similar to existing species in English streams and hedgerows, and some of the Wealden Conifers

* 4to., 49 pp., 8 plates, 6/-.

show a close resemblance to modern species characteristic of temperate countries. The fact that some plants are able to flourish under sharply contrasted conditions and that closely allied species occur in very different climates renders it very difficult to draw conclusions as to climatic conditions from data derived from a comparison of extinct and recent plants. While admitting the danger of basing opinions on extinct types, it is impossible to neglect the cumulative evidence presented by the great number of Wealden species that have their nearest living representatives in tropical and sub-tropical countries.'

ABSENCE OF FLOWERING PLANTS.

'In considering the vegetation as a whole we must not lose sight of a significant fact, namely, the absence from the great majority of Wealden floras of any representatives of the Flowering plants. We cannot form any adequate conception of the effect produced on the general facies of a flora by the introduction of this efficient class that later in the Cretaceous epoch had progressed far toward assuming its present dominant position. It may be that not climatic changes alone, but to some extent changes in the balance of power brought about by the progress of plant evolution resulted in the ousting of the numerous Cycadean genera and many other Jurassic-Wealden plants from the northern hemisphere. It is at least certain that in the Wealden period the type of vegetation was very similar to that which flourished over the greater part of the world during the whole of the Jurassic era, and it is equally certain that very shortly after the close of the Wealden period the vegetation of the world experienced a remarkable transformation. As we ascend the Cretaceous system the older types disappear, giving place to the vigorous and successful Flowering plants, the advent of which marks the first stage in the formation of modern floras.'

EAST RIDING ANTIQUARIES.

Volume XX. of the Transactions of the East Riding Antiquarian Society,* contains an elaborately illustrated paper on 'The Arms of Hull,' and another on 'Excavations at Peaseholm, Scarborough,' by Mr. T. Sheppard; the Rev. A. R. Gill has a lengthy paper on 'York Boy Bishops,' and the President, Colonel Philip Saltmarshe, gives 'Notes on Thorganby, East Yorks.' The Editor, Mr. Sheppard, also has a paper on 'East Yorkshire Antiquities,' in which he illustrates the various inscribed antiquities found in this area. There is a list of the Society's excursions, 1893-1914, and an index.

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x. + 70 pp., cloth, 8vo. A. Brown & Sons.

MORE ABOUT THE 'NEW' BIRD.

With further reference to the Notes and Comments in our January issue, we wrote to Mr. Hamilton pointing out that the bird he sold as a Little Bunting caught at Ripon, proved to be nothing of the sort, and suggesting that the price paid should be returned. A reply was received, obviously in Mr. Hamilton's handwriting, but ostensibly written by someone else, in which he stated that 'Mr. Hamilton as (*sic*) not had anything to do with the address since you bought the bird.'

THE POLICE.

We therefore communicated with the police who informed us that they had previously received complaints as to Mr. Hamilton's business methods; that his letters contained inaccuracies; that, though apparently written on his behalf, they were really written by himself, and that he was at home. They further informed us that Mr. Hamilton was ill and in poor circumstances.

AN APOLOGY.

As Mr. Hamilton had been visited by the police, we felt that the time had arrived to get a statement from him, with an apology. In reply to our letter he states, under date January 10th, 'I did not know a Lesser Black Headed Bunting, never having had one to my knowledge . . . and as to Ripon, one is apt in trade to make the most and get the most. . . . I very much regret selling you the bird incorrectly described . . . part of the other information (as to the locality) was only business in sale.'

MORAL.

After his various lapses of memory and terminological inexactitudes, this dealer therefore admits that his localities are tacked on to his specimens 'merely for business reasons,' and in order 'to make the most and get the most.' Such a method was doubtless adopted for the new Halifax Black-Headed Bunting, seen in the flesh in Sussex and now preserved in a Sussex Museum. Having thus fairly well proved that in this instance the record was wrong, there is quite a suspicion, in fact more than a suspicion, as to the bona fides of other recent records of new British birds, 'seen in the flesh.' We certainly think naturalists will now be justified in deleting several recent 'new records' from their lists.

—: o :—

In *Lincolnshire Notes and Queries* for October, published in January, is an account of 'Implements of the Stone Age, in the City and County Museum, Lincoln.' It is illustrated by four plates. We feel sure that the anonymous author is correct in assuming that the one palæolithic implement found in the county, now in the British Museum, was a comparatively recent importation into the county.

NOTES ON THE MERLIN.*

F. H. EDMONDSON.

I WAS interested in Mr. Taylor's paper read to the section on the Merlin, particularly when in March last I saw them on a moor. Mr. Taylor said they fed morning and evening. My birds fed every two hours, all through, possibly they were a little slacker about noon. The male never brought food to the nest. I never saw the hen take food on the wing from him as Mr. Taylor reported, but always from one of three rocks across the narrow valley. Mr. Taylor said his nest was untidy; considerable refuse bones, feathers and carcasses being left. My bird was the opposite. The nest was clean and tidy, though perhaps dead bracken tended in this direction in burying some of the refuse; but I saw very few feathers and only two or three bones. When flushed, the female invariably flew off with, or swallowed what was left.

The information as to what food was brought when I was not there, I got from the Plucking Stones.

I never saw the slightest trace of grouse, although there were many broods of young near. One brood hatched within two yards of a Plucking Stone.

The keeper reported that they had killed a young grouse 250 yards away. On going to look, I found a young grouse disembowled and partly eaten. I think, however it was the work of rats, or perhaps a stoat. The male and female have a quite distinct voice; the male being much higher and shriller than the female, he was always good and easy to distinguish. During the day time the young were brooded up to about seven days old; never afterwards.

The birds were on the moor by the end of March; were pairing by April 21st; there were four eggs on May 22nd; the eggs were chipped on June 17th; young flew 200 yards on July 22nd; there were two large eggs and two small; two females were hatched, one male, and there was one small addled egg. Therefore the large eggs would seem to contain females, and the small ones, males. Both the male and female sit on the eggs; both kill, though the male mostly; the female only once. The female only was at the nest after the eggs were hatched; the male hovered over once, or twice, but never alighted. Among the birds eaten were:—tit-lark, many sky-larks, young thrush, pied wagtail, sand piper, and old sky-lark, which was very tough.

——: o :——

In *The Mineralogical Magazine* for December, Dr. H. L. Bowman has 'Notes on Calcite from the Chalk at Corfe Castle, Dorset.'

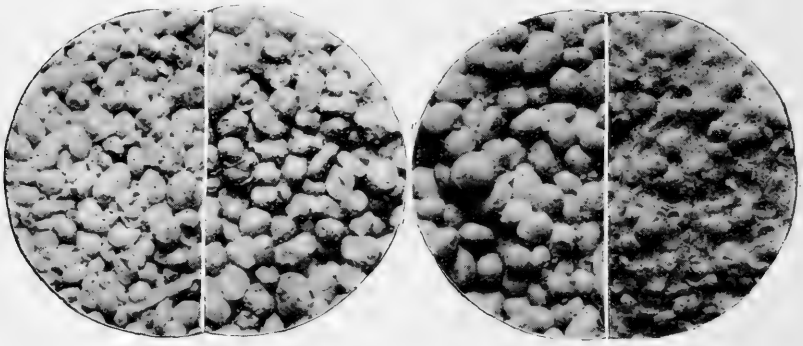
* Read at a meeting of the Vertebrate Section of the Yorkshire Naturalists' Union.

STRUCTURE OF OOLITIC LIMESTONE.

M. H. STILES, F.R.M.S.

As an aid to the selection of a Limestone for the repair of our Parish Church (St. George's, Doncaster), I recently examined several samples under the microscope. They were subsequently photographed, and the details are appended. All the samples were from Rutland.

No. 1, *Casterton*. In this case the oolitic granules are so loosely arranged that they are easily detached from the mass, and a surface suitable for photographing may readily be prepared by lightly grinding down a fragment on an ordinary stone sink moistened with water, washing, and subsequently



1 2 3 4

drying. The slight friction is quite sufficient to detach the granules without wearing away their surface.

With No. 2 from *Edithweston* this method does not answer, as the granules wear down and, to a great extent, lose their spherical form. Better results with stones of this character are obtained by chipping, and the selection of a piece with a fairly flat surface. Here the cohesion of the granules is sufficient to resist detachment in many cases, and consequently some of them are broken across in the process, as will be seen from the photograph.

No. 3 is a sample of *Ketton* Stone. The granules are larger than those of the other samples, and the prepared specimen was so extremely beautiful when examined with a binocular microscope that I reproduced it as a stereogram. When viewed through a stereoscope the structure is exhibited in a very graphic manner.

No. 4 is an oolite from *Clipsham*, near Oakham, yielded by a new bed just drawn into working. There is a very marked

difference between this and Ketton ; the granules are smaller, the cementation much more perfect, and the stone is consequently denser, and I should say more durable.

Photographic Details.

**Objective.*—2 inches without eye-piece, stopped down by the insertion of a diaphragm with a small central aperture at the back of O.G.

Magnification.—12 diameters in all cases.

Plate.—Ilford Chromatic.

Developer.—Rodinal 1 in 24.

Exposure.—5 minutes.

Illumination.—Paraffin lamp, flat flame, parallelised by a 2 inch double convex lens on to the concave mirror mounted above the objective and thence reflected on the object with as little obliquity as possible. In this way deep contrasts are avoided, and a softer and more natural appearance thereby secured.

Camera.—A horizontal one, with the illuminating apparatus raised sufficiently for the beam of light to clear the stage and reach the mirror.

N.B.—The Photographs have been reproduced on a smaller scale in the blocks (8 diameters), and are not so clear as the originals. To anyone particularly interested I shall be glad to send the originals for inspection, as well as the stereogram.

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ARACHNIDA.

New and Scarce British Arachnida.—Dr. C. F. George has kindly presented the following mites, recently figured in *The Naturalist*, to the Hull Museum, and this record is made so that students of the arachnida will know where the originals can be referred to:—*Trombidium mushami*, *T. bicolor*, *T. buccinator*, *Johnstoniana lævipes*, *Ottonia ignota*, *O. sheppardi*, *Rhagidia*, *Bryonia pratensis*, *Ammonia* (*Cyta*), *Bdella histrionum*, *Bd. hexophthalma*, *Bdella* spp. and larva, and larvæ, nymph, adult, and dissected details of *Ritteria nemorum*. Some of these are the type specimens. They are all mounted as microscopical preparations. A previous gift of a similar nature was recorded in this journal for November, 1911, p. 372.—T. S.

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* In taking the Stereogram, the aperture of the diaphragm was ex-centric, its position being reversed for the second exposure. These exposures were made on two plates $3\frac{1}{2}$ in. × $2\frac{1}{2}$ in., and care was taken that the illumination, exposures, developement and subsequent treatment were identical.

THE AMMONITES OF THE YORKSHIRE CORNBRASH.*

H. C. DRAKE, F.G.S,

THE Ammonites of the Yorkshire Cornbrash all belong to the genus *Macrocephalites*, of the family Stephanoceratidæ, defined thus:

Ammonites with numerous ribs, which cross the periphery without change, but which tend to unite on either side at some point near the umbilicus.

The Ammonites of this family commence in the Upper Lias and are almost confined to the Lower Jurassic, with the exception of the genus *Macrocephalites* which extends to the Oxford Clay. The *Macrocephali* are found in the Jurassic in most parts of the world.

The name is derived from μακρος, long, κεφαλη, a head. The genus is defined thus by Zittel in his Handbook to Palæontology :—' Involute, with broad, rounded exterior, all the whorls regularly covered with numerous sharp ribs, which divide into two or more near the narrow deep umbilicus. Sutures much divided.

The shell was first figured by Baier in 1757 but not named. Schlotheim in 1813 named the shell *Ammonites macrocephalus*. There are five recognised species in the Yorkshire Cornbrash, namely, *macrocephalus*, *typicus*, *herveyi*, *hudlestoni* and *compressus*. All my specimens come from the well-known Peacock's Quarry on the Seamer Road, Scarborough.

I have obtained *macrocephalus*, *typicus* and *herveyi* in the Cornbrash at Red Cliff and in Gristhorpe Bay, but the condition of the specimens was not good, all being without the shell, therefore in the nature of casts. In Peacock's quarry the conditions of deposition must have been different, the rock here is about 3 to 4 feet thick, but on weathering the bottom 18 inches is shown to contain a large quantity of broken up carbonaceous matter with sandy grains, and breaks up almost like the underlying sandstones, but of a slaty blue colour with black patches. In this, and almost at the lowest portion, I have found one or two specimens of *macrocephalus* and several like *typicus*, but all was in the form of casts. The upper portion about a foot from the top of the rock is the most prolific, out of 52 specimens in my collection *macrocephalus* form 26%, *typicus* 54%, *herveyi* 6%, *compressus* 6%, *hudlestoni* 8%.†

Macrocephalites macrocephalus. This is the species first figured by Baier in 1757, and called *A. macrocephalus* by

* Read at the Hull meeting of the Geological Section of the Yorkshire Naturalists' Union.

† In addition I have placed a typical series in the Hull Museum.

Schlotheim in 1813; *Nautilus tumidus* by Reinecke and *A. terebratus* by Phillips. This Ammonite is of great thickness (tumid), is 110 mm. wide at the end of the last whorl where the body chamber commences, and the height is 65 mm.; the diameter across the umbilicus is 145 mm. and the umbilicus is only 25 mm., nearly $\frac{1}{6}$.

In the small specimen the diameter across the umbilicus is 45 mm., and the umbilicus is 10 mm., or about $\frac{1}{4}$ of the diameter of the shell, besides being so small the umbilicus is very deep, the walls being almost vertical.

The ribs increase on the periphery and decrease towards the umbilicus by combination; on the periphery nearest to the body chamber there are four ribs in 23 mm., and at the commencement of the second whorl six ribs in 23 mm. in the largest specimen.

In the smallest specimen there are four ribs on the outer periphery in 10 mm., and on the inner six ribs in 7 mm.

In the adult form there is a gradual failing of the ribs until the surface is almost smooth.

Macrocephalus typicus Blake. This Ammonite is called macrocephalus by Zittel and Nikitin, and is figured as such by Zittel and Kayser-Lake. The sides are flattened, and the umbilicus quite vertical, the ribs enter the umbilical wall and curve backwards from the umbilicus to the periphery.

In this specimen the diameter is 95 and that of the umbilicus 15 mm., or just over $\frac{1}{6}$ of the entire diameter. The height of the last whorl near the body chamber is 28 mm., and its width 34 mm.

In a large specimen of this species the height is 56 mm., and the width is 98 mm.

There are four ribs in 23 mm. on the outer periphery, and eight on the inner one.

This handsome species is totally different from the first mentioned species, as it is also from the next species.

Macrocephalites herveyi Sowerby. This Ammonite has not flattened, but rounded sides, not globular in appearance as in *macrocephalus*, but really comes between the aforementioned two species. The umbilicus is not vertical but nearly so; the diameter of No. 1 is 110 mm., and the umbilicus is 30 mm., or about $\frac{1}{4}$ the diameter.

The height of the last whorl next to the commencement of the body chamber is 40 mm. and the width 60 mm.

There are nearly six ribs in 23 mm. at this point and seven at the commencement of the second whorl. They do not curve so much as in *typicus*, but are stronger and deeper.

In No. 2 the diameter is 120 mm. and the diameter of the umbilicus is about 30 mm. or $\frac{1}{4}$ the whole; the height is 35 mm. and width 55 mm.

On the outer periphery there are six ribs in 23 mm. and the same near the inner whorl.

Macrocephalite compressus Quenstedt. The three best specimens of this Ammonite that I possess are not in very good condition. They are all small and the best specimen shews the compression and very fine ribs which are very little curved in comparison to the other species.

There are sixteen ribs on the periphery nearest to the body chamber, and twenty-two on the periphery inside.

The diameter of the ammonite is 45 mm., and the diameter of the umbilicus is 8 mm.

The inner smaller ribs do not seem to join the thicker ribs, which continue to the umbilicus except occasionally, but seem to die away before the wall of the umbilicus is reached.

Macrocephalites hudlestoni Blake. The best specimen of this ammonite is 44 mm. in diameter, and the diameter of the umbilicus is 8 mm. The thickness is about 25 mm. or little more than half the diameter. The ribs have scarcely any curve and are thick about 10 in 23 mm. on the outer periphery, and 13 on the inner.

In all these ammonites the thickest part is always near the umbilicus which is, as a rule, very small.

The *Macrocephali* I think, are a peculiar genera of the *Stephanoceras* family, different from the other genera, especially by their closed up umbilicus.

It would seem, therefore, that these ammonites, coming in directly after the Estuarine series, and being continued to the Oxford clay, show that the Cornbrash is really the commencement of the Middle Jurassic, especially the upper half of this strata.

We are indebted to Dr. G. C. Crick for his assistance in the identification of the more critical species.

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Among the Committees of research appointed at the recent meeting of the British Association in Australia we notice a committee ' to formulate a definite system on which collectors should record their captures,' and another for ' a natural history survey of the Isle of Man.'

The Vicar of Wawne recently wrote to the press with evident concern. On his return home recently his wife found the cast skin of a grass snake on his back, and he asks for information as to how it could possibly have got there. If he had been a layman it might be suggested that on returning from Christmas revels he must have fallen into a dyke or into a field where such objects occur. But as he is a clergyman we cannot say.

The Yorkshire Observer for December 9th gives a list of the members of the Leeds Naturalists' Club who have joined the Forces, viz., Captain J. H. Priestley, Captain H. J. Robson, Lieutenant A. M. Lupton, Second Lieutenant E. H. Croft, H. Murphy, N. T. B. Turner, W. Withell, C. D. Ingleby, F. Fowler, A. Hodgson and E. J. T. Ingle. In addition, Professor Garstang is Chairman of the Military Committee in charge of the Officers' Training Corps of the Leeds University.

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Naturalist.

MOSSES FROM PRE-CARBONIFEROUS ROCKS NEAR AUSTWICK.

CHRIS. A. CHEETHAM.

During the past year, Mr. Haxby and I have been working over the pre-carboniferous rocks around Austwick and Helwith, the West Yorkshire records for the type of mosses generally associated with these siliceous rocks being sparse, and there being evidence in the lack of Ribblesdale records that the district had not been carefully worked. We have been amply repaid by the discovery of many new drainage records and also by finding in quantity mosses which are generally very scarce and in small patches in West Yorkshire.

The district, when looked at casually, does not give much encouragement to a bryologist, the streams and gullies face too much to the south, requisite shade being lacking; careful search however, soon dispelled this impression. One of the first interesting facts noted was that some of the typical alpine mosses, *Andreæas*, occurred in sheets at the low elevation of 700-800 feet, with them being the alpine bryum also in quantity. This was an incentive to further search. Another isolated outcrop of rocks of a more slatey nature was found to be covered with *Cynodontium Bruntoni*, quite a new moss to the district. Again, a few surfaces of rock sloping steeply northwards were found to have a growth of *Rhacomitrium protensum*, quite suggestive of the Lake district; on an outcrop facing directly south and seemingly very dry, a colony of *Grimmias* has taken hold, an interesting discovery being *G. subsquarrosa*, already noted in this journal.

There are other mosses which we expected to find frequently but which are not plentiful, *Ptychomitrium polyphyllum*, *Hedwigia ciliata*, and *Pterogonium gracile* are seen occasionally, but seem by their distribution to be only just capable of maintaining their footing. The first mentioned is generally found freely on this type of rock. An interesting occurrence of the *Pterogonium* is on the limestone at Stainforth Force in Ribblesdale, a list of plants on page 76 of 'West Yorkshire Flora' cites this species as absolutely confined to slate rocks in West Yorkshire. A moss which is much more frequent than our flora states is *Rhacomitrium heterostichum*, being commonly found all over the district. *Campylopus atrovirens* is also widely distributed, and is a good index to the type of rocks.

In passing from Crummock dale head to the Ribble valley, the path crosses over the limestone plateau of Moughton, and here we see that *Hylocomium rugosum* is by no means the rarity we supposed, for on limestone screes it is generally to be found, and in places in great profusion. Careful search

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here will bring *Cylindrothecium concinnum*, and on one scree facing west where *Saxifraga oppositifolia* grows, we get *Trichostomum tortuosum* var. *fragilifolium*; in vertical clefts of the limestones we can also find *Mnium orthorrhynchum*; a *Thuidium* found on these dry places is the one previously reported by us from Ingleborough, *T. Philibertii*; it has recently been classed as a variety and called var. *pseudo-tamarisci*.

The mosses group themselves in fairly distinct associations, if we get a flat surface of siliceous rock at a low angle with slight moisture draining over it, we shall find usually *Andreæa Rothii* var. *falcata*, *A. crassinervium*, *A. petrophila*, *Rhacomitrium heterostichum*, *R. fasciculare*, *R. aciculare*, *Campylopus atro-virens*, *Bryum alpinum*.

The nerved *Andreæa* is much the most frequent, the *Rhacomitria* vary according to the amount of moisture, *fasiculare* if fairly dry, *aciculare* if wet. The *Campylopus* and *Bryum* vary in appearance with the moisture, in the wet places the former has much shorter or almost lacks the hair-point, and the *Bryum* looses the rich crimson metallic sheen, passing into the green variety; very occasionally in these places we get the var. *nigro-viride* of *Trichostomum crispulum*, and the var. *acutifolium* of *Diphyscium foliosum*; the frequent *Zygodon* (*Amphoridium*) *Mougeotii* in similar situations is very different in appearance and handle, being black below in place of the light brown, and harsh to the touch.

Another group is that of the *Grimmias* on the rocks facing south below Moughton. Here we get a type of moss which can stand a large amount of drying; some experiments made by E. Irmscher and published in *Jahrb. f. wiss. Bot.* 50, pp. 387-449, showed that *G. apocarpa* still had a quarter of its leaf cells living after drying in a dessicator for 128 weeks; *G. pulvinata* showed a similar result after 60 weeks' drying, wheras the mosses usually found in water were soon killed, *Fontinalis* only surviving five days' treatment. The species found here include *Grimmia apocarpa*, *G. funalis*, *G. pulvinata*, *G. subsquarrosa*, *G. doniana*; *G. funalis* and *subsquarrosa* being far the most plentiful, some tufts of the latter have the gemmæ in perfect condition. They appear not to have been found in the British Isles in this state before.

Our next group is the moss flora of scattered siliceous boulders. This is fairly regular, the main part being *Rhacomitrium heterostichum* with a little *R. fasciculare*, and *Grimmia apocarpa*, this being of the *gracilis* type; if sufficient soil, we find *Polytrichum piliferum* and occasionally *Hypnum cupressiforme*. On one or two out of a great number examined we found *Hedwigia ciliata*.

In the following list the nomenclature adopted is that employed in the census catalogue of the British moss club,

but where the name differs in the Flora of West Yorkshire or in Braithwaites Moss Flora, these synonyms have been added ; this apparently being the only way to deal with a difficulty which is very real and discouraging to beginners.*

Where the moss is new to either Ribble or Lune drainage, it is shown by the letters L or R in parenthesis.

(R.) *Andreæa petrophila.*
(R.) ,, *Rothii.*
(R.) ,, *Rothii* var. *falcata.*
(R.) ,, *crassinervia.*

These mosses are found in quantity in Crummockdale and under Moughton, opposite Horton in Ribblesdale. They cover many square yards of surface, making the rocks quite black in appearance. The altitude, 700-800 feet, is very low for these species in our latitude, and is due to the influence of the surrounding mountains.

(R.) *Diphyscium foliosum* (*Webera sessilis*).
(R.) *Diphyscium foliosum* var. *acutifolium.*
(R.) *Fissidens osmundoides.*

We have before shown these to be on Ingleborough ; this note extends their range into Ribblesdale.

(L.) *Fissidens crassipes* (*F. viridulus* var. *fontanus*). Between Clapham and Austwick.
(L.) *Pleuridium subulatum.* Ingleton.
(R.) *Seligeria pusilla.* Frequent in vertical clefts of the limestones.
(R.) *Seligeria recurvata* (*S. setacea*). On siliceous rocks of a soft texture.
Cynodontium Bruntoni (*Dicrano-weisia*) (*Oncophorus*). In plenty in one place in Crummockdale.
(R.) *Blindia acuta.*
(R.) *Campylopus atrovirens.*
(L. R.) *Grimmia subsquarrosa.*
(R.) *Rhacomitrium protensum* (*Grimmia aquatica*).
(R.) *Ptychomitrium polyphyllum* (*Glyphomitrium*).
(R.) *Hedwigia ciliata* (*H. albicans*). In Arco wood, it is only in small quantity here, and occurs further south, beyond the faults, on millstone grit walls near Lawkland.

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* If this plan of giving the synonomy, whenever a difference exists in these three lists, were generally adopted, it would matter little which nomenclature was used by the writer at the time, and also would enable anyone to refer to our flora for the known distribution of any species at that time. Many beginners get Jamison's Key to British Mosses in the reprint from the Journal of Botany, and with this the West Yorkshire Flora is in line, but when the worker takes up Dixon's book a new system has to be mastered, and this later may have to be revised with Braithwaite's, the latter being the only one to give a full synonomy.

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(R. L.) *Acaulon muticum* (*Sphærangium*). On Smearside, and near Austwick.

(L.) *Tortula ambigua* (*T. ericæfolia, Barbula*). Near Ingleton.

Barbula lurida (*Didymodon*). Streamside, near Austwick.

(R.) *Trichostomum crispulum* var. *nigro-viride* (*Mollia*). Found on flat wet rock surfaces.

(L.) *Trichostomum tortuosum* var. *fragilifolium* (*Mollia*). Screes, Moughton summit.

(L.) *Splachnum ampullaceum*. Austwick moss.

(R.) *Tetraplodon mniodes*. On bones in old slate quarry, Arco wood.

(L.) *Funaria ericetorum* (*F. obtusa. Entostodon*). Great Blake Gill, also between Helwith and Stainforth bridges.

Funaria calcarea. Feizor.

Amblyodon dealbatus. Dripping limestone rocks above Warfe village.

(R.L.) *Bartramia pomiformis*. At Craghill and at Warfe.

(R.) *Bryum filiforme*. Arco wood.

(L.) ,, *concinnatum*. Crummockdale head.

(R.) ,, *alpinum*. Fruiting in Arco wood.

(R.L.) ,, *alpinum* var. *viride*.

Leucodon sciuroides. In plenty, Austwick-Warfe.

Antitrichia curtipendula. Warfe, Helwith and Clapham.

(R.) *Pterogonium gracile* (*P. ornithopodioides*). On limestone at Stainforth and also found near Arco quarry.

(L.) *Leskea polycarpa*. Riverside near Clapham Station.

(L.) *Cylindrothecium concinnum* (*Entodon orthocarpus*). Crummockdale head and Moughton Scar.

(L.) *Hypnum patientiæ* (*H. arcuatum. Stereodon lindbergii*) Wood below Beezley falls.

(R.) *Hypnum scorpiodes* (*Amblystegium*). Helwith moss.

(R.) ,, *straminium* (*Amblystegium*). Helwith moss.

(R.) ,, *sarmentosum* (*Amblystegium*). Arco wood.

(R.) *Hylocomium rugosum* (*Hypnum*). Moughton Scar.

This list adds 14 species or varieties to the Lune drainage, and 27 to the Ribble. It shows that it is possible by use of geological information, coupled with a knowledge of the moss flora of the various rocks, to pick out districts where the published information is seen to be lacking these types.

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We regret to notice the death, towards the end of 1914, of Mr. W. Hill, F.G.S. Many years ago he did some excellent work among the chalk of Yorkshire and Lincolnshire; his papers on the Lower Chalk have never been superseded.

YORKSHIRE'S CONTRIBUTION TO SCIENCE.

(Presidential Address to the Yorkshire Naturalists' Union, delivered at the University, Leeds, 5th December, 1914.).

By T. Sheppard, F.G.S.

(*Continued from page 25*).

MAGAZINES NOW EXTINCT.

The present instalment includes particulars of the magazines and journals which are no longer being published. Many are directly connected with Yorkshire; others contain items bearing upon the natural history, etc., of the county. Detailed particulars of these are given, as several of the publications are now very scarce, in many cases my own being the only complete sets I have been able to trace.

In addition to the following, there are such publications as 'The Halifax Naturalist,' 'The Bradford Scientific Journal,' and the journals issued at Barnsley, Keighley, etc., which, however, will be dealt with under the heads of the respective towns.

There are a number of other magaizines, such as 'The Midland Naturalist' (1878-1893, 16 vols., 8vo); 'The Essex Naturalist' (1887-1914, 15 vols., 8vo), etc., but these for the most part have no particular bearing upon our county, and are not included.

The Circulator.

In 1861 the Haley Hill Literary and Scientific Society was formed in Halifax.* In 1866-7 it published an interesting magazine, *The Circulator*, a magazine of Literature, Science and Art, conducted by members of the Haley Hill Literary and Scientific Society, 1886-7. It bears the imprint 'Halifax' and is dated 1867. The volume I have seen† contains 190 pages, 8vo, but there is nothing to show how frequently it appeared nor how many pages were issued at a time.‡ There are interesting papers on the natural history and geology of the district, as well as on poetry, music, etc. Several of the contributions contain the earliest records of the district. The Haley Hill Society may be said to be the parent of the Halifax Scientific Society.

The Practical Naturalist.

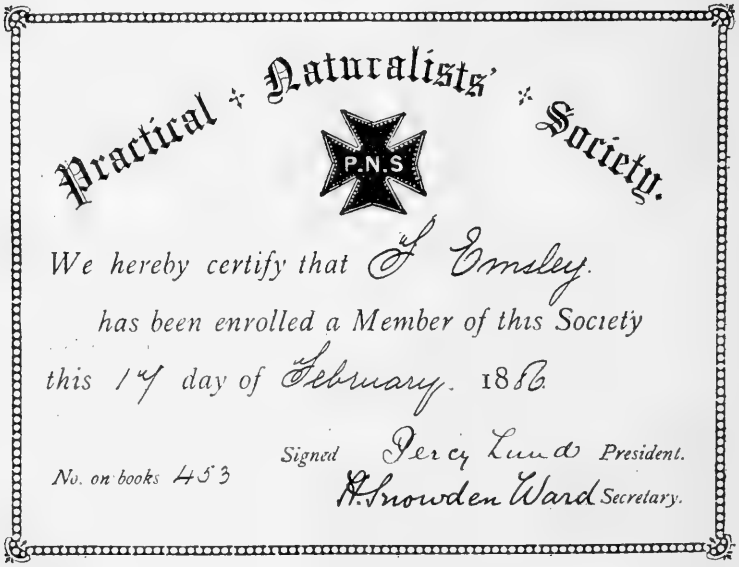
Between January and December 1883, a magazine called 'The Practical Naturalist,' which contained 140 8vo pages, in double columns, was issued, printed and edited in Bradford,

* For a description of the Society and its work see *The Halifax Naturalist*, Vol. VI., pp. 89-92.

† Since given to me by a Halifax friend.

‡ Up to page 117 there are six 'continued' articles on Geology by J. S[pencer], so that probably about a dozen parts were issued in all.

by H. S. Ward and H. J. Riley, who were printers and booksellers. It contains a number of short natural history articles, among which are several by Yorkshire naturalists. The journal was evidently the organ of the 'Practical Naturalists' Society,' a card of membership for which, with a list of Fellows and Members, Rules, and a list of books, are bound up with my copy. The membership card is signed by Percy Lund, President, and H. Snowden Ward, Secretary. From the preface to the volume we learn that 'At the end of our first year (which is also our last) .... we take the sole responsibility for the failings which are so


Practical Naturalists' Society.

P.N.S

We hereby certify that J. Emsley.

has been enrolled a Member of this Society

this 17 day of February. 1886

No. on books 453

Signed Percy Lund President.

H. Snowden Ward Secretary.

Reduced fac-simile of Membership Card of the Practical Naturalists' Society.

numerous in our little magazine .... We regret giving up what has been truly "a labour of love," but the work is too great for us.' The preface was as true as it was candid.

The Naturalists' World.

Mr. Scruton, in Turner's *Yorkshire Bibliographer*, vol. I., 1888, pages 105-110, says: '*The Practical Naturalist* was continued at Ilkley.' This led me to look in that direction, and I find that another journal was certainly published at Ilkley, and in the preface, reference is made to 'Our *Practical Naturalists' Society*.' Not a word, however, is said of the dead *Practical Naturalist*, and in every way the Ilkley publication must be looked upon as quite separate and distinct.

No. 1 of the first volume was published in January, 1884. It

was edited by Mr. Percy Lund, and printed and published* by Percy Lund and Co., at the County Press, Ilkley. It was a small 4to, with double columns, and illustrated; there were 16 pages a month, and the first page of each issue was numbered and dated. The first volume contained 216 pages in all. Vol. II. (Nos. 13-24), 1885, 236 pages; vol. III. (Nos. 25-36), 1886, 220 pages; and vol. IV. (Nos. 37-48), January to December, 1887, 208 pages. With this volume appears the usual epitaph: 'With its fourth volume, *The Naturalists' World* ceases publication. This step has been taken because it has been found impossible to render it a pecuniary success.'

When it commenced, *The Naturalists' World* had a largely 'Yorkshire' character, and many contributors to our own journal wrote also for it. The very first article in the first number was by our old friend the late Rev. W. C. Hey, on 'Shells.' J. W. Davis followed on 'Geological Evolution.' The late William West commenced the second part with 'Plant Gossip.' Among other familiar names in these early parts we notice W. J. Clarke, P. F. Lee, J. E. Wilson, W. H. Hutton, T. D. A. Cockerell, H. Wallis Kew, and W. D. Roebuck.

The Young Naturalist.

Many Yorkshire workers contributed to *The Young Naturalist*, an illustrated 8vo journal which began in November, 1879, and continued until December 1890, when it completed its eleventh volume. It was edited by J. E. Robson, of Hartlepool and S. L. Mosley of Huddersfield. It was at first 'a weekly magazine of Natural History' of 8 pages (occasionally four pages only), 8vo, double columns.

Volume 1, ended with page 416, on October 30th, 1880.
,, 2, similarly edited, contains parts 54-103, and 364 pages
,, 3, contains parts 104-155, in all 411 pages, with 12 lithographed plates.
,, 4, The journal became a monthly with this volume, and was sold at 6d. It contains parts 37-48,† with a total of 280 pages.
,, 5, parts 49-60 contains 292 pages.
,, 6, parts 61-72, 282 pages, and 40 pages of supplement. With the February number of this volume, and onwards; it was edited by Mr. Robson only.
,, 7, parts 73-84, contains 254 pages.
,, 8, parts 85-96, contains 104 pages.
,, 9, parts 97-108, contains 200 pages.
,, 10, parts 109-120, contains 252 pages.
,, 11, parts 121-132, contains pages 240-232.

* The first volume only has the name of W. Swan Sonnenchein & Co., London, as the publishers.

† This evidently assumes that the first three volumes contained monthly parts.

In January 1891, the journal was published under the title of

THE BRITISH NATURALIST.

This journal continued from 1891 to December 1894, four volumes, the last volume bearing the same title, but called a 'New Series,' and was edited by Joseph Smith and Linnæus Greening.

In the third volume Mr. Robson informs us that during the previous fourteen years he had edited *The British Naturalist* and its predecessor *The Young Naturalist*, and regrets that the publication must cease on account of illness. However, it was continued by other editors, but only for one year.

Volume 1, contains parts January 1891 to December 1891, numbers 1-12, and 272 + 86 pages.
,, 2, parts 13-24, and 269 pages.
,, 3, parts 25-36, and 256 pages.
,, 4, (New Series), 298 pages, dated January to December, 1894.

A feature of these journals was the illustrated biographies of field naturalists.*

THE NATURALISTS' MONTHLY.

A magazine with the above title, 'devoted to the study of Natural History,' edited by R. Christie, and printed and published by A. Robinson of Bradford, appeared in October, 1882, but apparently ceased after the publication of its third number, for February, 1883.†

THE NATURALISTS' JOURNAL.

In July, 1892, the first part of 'The Naturalists' Journal,' (12 pages 8vo), appeared, edited by H. K. Swan, published by Elliot Stock, and sold at one penny. By June, 1893, the first volume (144 pages) was completed. By May, 1894, however, we learn that Mr. Swan was not able to give the time necessary for carrying out the 'great improvements contemplated by the proprietor,' and the title page of the second volume (Nos. 13-24, July, 1893-June, 1894, 194 pages) bears the names of A. Ford and A. H. Waters.

Volume III. continued for six months‡, in order that the volumes might begin with the January number. In November Mr. S. L. Mosley was joint editor in place of Mr. Waters,§ and we learn that 'in future the journal is to be printed in Huddersfield.'

* My set was formerly Mr. Robson's.
† See *Yorkshire Bibliographer*, Vol. I., 1888, p. 108.
‡ Ends with No. 30, December, 1894, 148 pages.
§ Judging by references to 'Leaflets circulated by the late manager,' there has been trouble!

With the 5th volume, the words 'and Naturalists' Guide' were added to the title, and it became 'The Monthly Organ of the Economic and Educational Museum, Huddersfield.' In the 6th volume, the title was altered to 'The Naturalists' Journal and Guide' and it also became the organ of the British Field Club. Volume 7 included monographs of Galls and Boleti. In 1900, (the 9th volume), the title was again changed to *The Naturalists' Journal* incorporated with which was *The Naturalists' Guide.* Mr. S. L. Mosley retired from the editorship, which was taken over by his son Charles, who also printed the journal. By volume XI. (1902) the Journal reverted to its 1899 title, and though it commenced under the editorship of the son, the father's name alone, once more, appeared on the title.

Nature Study.

Under this title the journal apparently begins a new career. Instead of being volume I., however, it is volume XII.—the number of the volume being continued from *The Naturalists' Journal.* By its second volume, the title was again altered to 'Nature Study and The Naturalists' Journal,' and presumably the son again takes charge; with the following year, 1905, volume 3, or volume 14 as the case may be, ceased. It is to be hoped that it is merely a coincidence that the title page appearing with the final part, was adorned with a quotation from a paper of my own!

The first of these volumes is composed of small sections of what were presumably some day intended to be complete memoirs on various subjects, had they continued. Each one begins a fresh pagination, which makes the binding difficult, and the sequence well nigh impossible to follow.

These various volumes issued from Huddersfield are illustrated by blocks in the text and numerous coloured plates, which were entirely the work of Mr. S. L. Mosley. How he was able to produce them in such quantity was always a puzzle to me; they speak well for his ability and industry.

We may add that the key note of these volumes was the economic aspect of natural history.

The New Nature Study.

In October 1912, Messrs. S. L. and F. O. Mosley, published No. 1, New Series of *The New Nature Study.** (8vo) 'The contents' include 'vol. XIV., Vertebrate Animals, pages 1-2 and 5-10; vol. XV., Insects, pages 1-2; vol. XVI., Huddersfield District,

* Published at the *Nature Study* Office, Beaumont Park, Huddersfield. This number is styled 'No. 163 from Beginning,' from which, apparently, the numbering has commenced from the first part of its predecessor, *The Naturalists' Journal.* See *The Naturalist* for 1913, p. 12.

pages 1-2.' Further numbers contain parts of volumes in the same way, up to vol. XXVII., 'the Farm.' Apparently, had all gone well the parts should have been taken out and eventually bound up into volumes, but as only 12 parts of this new series appear to have been published, this was not done.

Each part averaged 16 variously numbered pages, contained coloured and other plates, and was sold at 6d.

Naturalist Notes.

In June 1894, appeared an octavo magazine with the above title, being 'A monthly record of local and scientific natural history observations, published under the auspices of the Malton Field Naturalists' and Scientific Society.' Thirteen parts of eight pages each appeared at the price of 1d. each. At the completion of this volume the parts were bound together and sold in one volume at 1s.

In July 1895, apparently the same publication was continued for another thirteen months, but, though styled volume II. (parts 14 to 25) and vol. III., No. 26, the heading was altered to

North and East Yorkshire Science Notes,

From an editorial it seemed that it was considered that 'the word "science" takes in a wider scope of objects and subjects than the word naturalist, and the scientific man must above all things be consistent and have everything in apple-pie order.' Under the new name, however, only thirteen parts were issued and the Malton publication ended its career with the twenty-sixth issue since it started as 'Naturalists' Notes.' However, the little magazine contains many interesting records relating to the Malton district.

The Natural History Journal.

This little magazine was started in York in 1877, and was 'conducted by the Societies' of Friends' Schools.' From its commencement to the year before its close it was edited by Mr. J. E. Clark, sometimes with assistance.

It was an 8vo magazine, frequently illustrated, and there were on an average over 200 pages to the volume.

It commenced in February 1877, and in December of the same year completed its first volume (160 pages). Then, regularly for twenty-two years, its parts were published, and were bound up in the well-known green cloth covers, the final part (No. 198) being published in December, 1898. Nine parts were published each year, none appearing in the months of January, July and August, owing to vacation.

Though primarily intended for the scholars attending the Friends' Schools, where, as we well know, a strong feature is made of the study of natural history, the volumes contain many interesting and important records referring to the county.

In the last part (December 1898) we learn that 'for twenty-two years has *The Natural History Journal* been an institution in our schools. . . . Probably the feeling was shared by many of us that when Mr. J. E. Clark was compelled to retire from the post of editor it would be difficult, perhaps impossible, adequately to fill his place.' The new editor only accepted the post 'on condition that the paper paid its way; but the fact is the excess of expenditure over income for 1908 is £17, and the financial editor feels that he cannot face another year with a similar prospect awaiting him at the end of it.'

Since the cessation of the Journal, the Annual Report of the Bootham School Natural History Society has to a small extent taken its place.

NATURAL SCIENCE.

This shilling monthly magazine (large 8vo), published by Macmillan, was by far the finest magazine of its kind on the market. It was edited anonymously, though we have an idea how and where, and we believe Yorkshire had a finger in the pie. Its criticisms were favourable where praise was due, and caustic where considered necessary. It made a special feature of its current 'Notes and Comments,' book reviews, and smaller news items, and many were made to smart by its lashings. Its contributions were of an exceptionally high order.

Volume I. (March to December 1892, contained 800 pages. It included articles by J. W. Davis, Thomas Hick, Clement Reid, A. Smith Woodward, Henry Woodward, J. E. Marr, Alfred Harker, J. J. H. Teall, W. C. Williamson, A. C. Seward, A. J. Jukes-Browne, R. Lydekker, G. A. Boulenger, H. O. Forbes, and others well known to Yorkshire naturalists.

Subsequent volumes (2 to 15) were published, two each year, and averaged 500 pages each. The publishers were changed on more than one occasion, and towards the end, the editorship was apparently also altered.

The first 'Note and Comment' in the issue for December, 1899, was entitled 'Eliminated,' and read: 'It is one of the conditions of continued vigorous activity on an organism's part that income be at least equal to expenditure, and the same is true of journals. To try to sustain the activity when the aforesaid condition is not fulfilled is not uninteresting, but there are limits to the possibility of continuing it. We regret to say that we have reached these limits as regards National Science. . . . We make our bow, then, to the process of natural elimination.'

(*To be continued*).

——: o :——

No. 27 of the Quarterly Notes issued by the *Belfast Museum* is devoted to 'Old Domestic Plenishings,' and No. 26 to 'Objects connected with Tobacco Smoking,' etc.

COCCIDAE OBSERVED IN DURHAM AND NORTH YORKSHIRE.

J. W. H. HARRISON, B.Sc.,
Middlesbrough.

THE Coccidae, or Scale Insects, observed up to the present time in Britain, number about 100 species and, of these, I fear not one half have any right to be regarded as anything more than 'naturalised aliens,' and very undesirable ones, too. Be that as it may, it is customary to include them in British lists on account of their great economic importance; hence, in spite of the fact that most of my work is done out of doors, I venture to list species taken in greenhouses to which, through the courtesy of friends, I have had access. I give, too, the species I have been able to secure from fruit purchased in shops.

Whilst, on account of our climate, I expected to find our local Coccids few in numbers, I was surprised to find that there was a total absence of certain well-known indigenous species, and I find that these species, when tabulated, are chiefly oak-feeders. In fact, despite diligent search, I have never seen an oak feeding species either in Durham or in Yorkshire.

On the whole, however, we have a fairly representative list, including species from all of the sub-families, and I have hopes that I shall yet secure some of the missing forms, and that thus our somewhat short list will be materially extended.

Aspidiotus aurantii (Maskell).—Once, on lemons bought in Middlesbrough.

Aspidiotus bromeliae (Newstead).—Rare on pineapples in Middlesbrough.

Aspidiotus dictyospermi var. *arecae* (Newstead).—On palms in greenhouses in Middlesbrough.

Aspidiotus hederae (Vallot).—In enormous quantities in the sheaths at the base of palms in a green house at Birtley. I have bred an excessively minute hymenopterous parasite from this.

Aspidiotus perniciosus (Comstock).—This is the far famed and dreaded San José Scale, a pest that has cost millions of dollars and destroyed thousands of fruit trees belonging to the order *Rosaceae* in the United States, and in that small portion of Canada between Lakes Huron and Erie. I once saw a few specimens on a pear in the Greenmarket, Newcastle-on Tyne. It is exceedingly unlikely that it will do any damage here as it owes its destructive powers abroad to the frequency of the broods during the hot summer. Here, even if it did escape, it would be single-brooded and barely able to hold its own under the most favourable conditions. It might however,

be extremely harmful to peaches and nectarines under glass if once allowed to secure a footing.

Parlatoria proteus (Curtis). Rare on Cypripediums under glass at Birtley.

Parlatoria proteus var. *crotonis* (Douglas).—I once got this on *Croton* but failed to record the locality. In all probabilty it was at Birtley.

Parlatoria pergandii (Comstock).—On imported oranges, commonly.

Parlatoria zizyphi (Lucas).—On oranges, but rare.

Chionaspis salicis (Linn.)—Our most abundant Coccid, occurring everywhere in the Birtley district on Alder (*Alnus glutinosa*), Ash (*Fraxinus excelsior*) and Sallow (*Salix caprea et S. cinerea*). On ash and *Salix aurita* near Middlesbrough. It is particularly destructive to *Salix cinerea* on Waldridge Fell, and the weakened trees soon fall victims to the Weevil (*Cryptorhynchus lapathi* Linn.)

Chionaspis aspidistrae (Signoret).—Once on Ferns at Birtley in a hothouse.

Mytilaspis pomorum (Bouché), the Common Mussel Scale.—Not as abundant as one would expect. On *Salix caprea*, *S. aurita* and blackthorn, at Birtley, but on apple at Low Fell.

Eriopeltis festucae (Fonscolombe).—This has turned up not infrequently at Birtley on grasses, not necessarily, but sometimes, of the genus *Festuca*. The species is localised in the old quarry field in a very small area, well sheltered from north and east winds.

Signoretia luzulae (Dufour).—Near the above, on *Luzula campestris*, but in much smaller numbers and not always to be found when looked for.

Lichtensia viburni (Signoret).—I discovered this for the first time at Birtley, on ivy, whilst I was looking for *Eriopeltis festucae*. Only two specimens occurred.

Pulvinaria vitis (Linn.)—Scarce at Birtley on blackthorn, and only on one tree.

Pulvinaria vitis var. *ribesiae* (Signoret). Rarely on blackcurrant (*Ribes nigrum*) in an old garden at Birtley. Now, I fear, extinct as the bushes were killed by the Currant Moth (*Abraxas grossulariata*).

Lecanium hesperidum (Linn.)—On young Abutilons in a greenhouse in Middlesborough. Now rare, but I was told that it had formerly abounded.

Lecanium persicae var. *coryli* (Linn).—Once on hawthorn at Birtley.

Lecanium bituberculatum (Targioni-Tozzetti).—Now gone, but formerly quite common on a row of hawthorns in Middlesbrough.

Lecanium capreae (Linn.)—This is very common, if some-

what local, both at Birtley and in Middlesbrough. I have taken it from both blackthorn and hawthorn but certainly not from the plant *Salix caprea* from which it derives its name.

Lecanium coffeae (Walker) (=*hemisphaericum*, Targioni-Tozzetti).—My friend Mr. John Baxter, late of Birtley, but now in the army, discovered this on a fern of the genus *Pteris* at Birtley. I cannot resist giving Mr. Baxter a word of thanks here for help rendered in searching for minute species of all groups—help I hope he will be able to continue when the war is ended.

Dactylopius citri (Risso).—This was very common on young orange trees, aspidistras, etc., etc., in a greenhouse at Birtley.

Dactylopius longispinus (Targioni Tozzetti).—With the above on various plants, including *aspidistra, aralia,* etc., at Birtley. This, with the preceding, is the Mealy-Bug of gardeners.

Dactylopius walkeri (Newstead).—Rather scarce on the marram and other grasses on the sandbanks at Redcar and Marske.

Pseudococcus aceris (Signoret).—This species has proved unaccountably scarce and has only occurred to me once, and that in small numbers, on blackthorn at Chester-le-Street.

Ripersia subterranea (Newstead).—When working ant's nests on the sandy ground at the base of the sea banks at the Black Hall Rocks, just north of the hotel, I found this sparingly on grass roots in the nests of *Lasius flavus*. I have not, however, seen the ant for a year or two, i.e., since the new Black Hall Rocks Colliery was opened.

Eriococcus insignis (Newstead).—Not common on grass on Waldridge Fell, and only on the banks of the burn.

Apterococcus fraxini (Newstead).—I got this not uncommonly on an ash in the village of Birtley two years ago. This provided the first northern record, but the hopes I formed then of finding it well distributed have been unsatisfied.

Cryptococcus fagi (Bärensprung), the Felted Beech Coccid.—Common at Ravensworth, but rare nearer Birtley in Durham. Quite common in Guisbrough Park Wood, near Ormesby and Marton in Yorkshire. On beech (*Fagus sylvatica*) of course.

Newsteadia floccosa (De Geer).—This interesting and curious looking creature has occurred, although not freely, amongst *Polytrichum*, at Eston (Yorks.) and on Waldridge Fell (Durham). It occurred in much drier spots than its relative *Orthezia cataphracta*.

Orthezia cataphracta (Shaw).—This occurs everywhere on the moors, amongst very damp sphagnum, in this district. In Durham it is just as abundant in similar spots on Waldridge Fell, although rarer on Birtley Fell, occurring there rather amongst *Polytrichum* and rushes.

Orthezia Sp.—I think I have a new species of this genus differing in size and in the dorsal plates from *O. cataphracta*. This I got amongst Sphagnum on Great Ayton Moor.

P.S.—In spite of what is said above about the non-occurrence of oakfeeding Coccids in our area, I took such a species on Nov. 9th. This was *Aspidiotus zonatus* (Frauenfeld). Over-wintering females occurred sparingly on scrubby oaks near Nunthorpe Station.

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The Irish Naturalist for January contains a paper on 'The Geography of Ireland as a field for Irish naturalists,' by Prof. G. A. J. Cole.

Mr. W. G. Travis contributes 'Bryological Notes in the Ingleton District,' to the *Lancashire and Cheshire Naturalist* for December.

Mr. W. H. S. Cheavin favours us with a reprint of an illustrated paper on the Common Gnat, which appeared in *Knowledge*.

In a recent issue of *The Journal of Economic Biology* (pp. 105-125), Mr. J. W. H. Johnson writes 'A Contribution to the Biology of Sewage Disposal.'

The Irish Naturalist Vol. 23, No. 10 contains 'A Note on the Anatomy of the Irish Vitrina described as v. *pyrenaica* or v. *hibernica*,' by A. E. Boycott.

In *The Journal of Conchology* for January, *Helicella virgata* m. *sinistrorsum* is recorded near Scarborough, this being the fourth record for the neighbourhood.

'Notes on High Mortality among Young Common Terns in certain seasons,' by A. R. Galloway and A. L. Thomson, appear in *The Scottish Naturalist* for December.

In the *Journal of Anatomy and Physiology*, volume 49, Mr. J. W. Jackson describes some Dental Mutilations found in a cave known as 'Dog Holes,' on Warton Crag, Lancs.

Part 90 of the *Yorkshire Archaeological Journal* is almost entirely devoted to 'Anglian and Anglo-Danish Sculpture in the West Riding' by Professor Collingwood, and is very well illustrated.

Mr. G. T. Porritt records the 'Abundance of *Pyrameis cardui* at Bridlington,' in *The Entomologist's Monthly Magazine* No. 606. Mr. E. G. Bradford records the abundance of the same species near Sheffield, in No. 607 of that journal.

In No. 880 of *The Zoologist* Mr. A. H. Patterson gives some 'Miscellaneous Notes from Great Yarmouth'; in No. 881, Mr. O. V. Aplin gives 'Notes on Oxfordshire Ornithology, 1913'; in No. 882, 'Extracts from a Shooter's Note-Book in 1866, including the Great Frost.'

We learn from *The Lancashire and Cheshire Naturalist* for December that 'After having once been almost delegated to the formation of a local art gallery and museum, to end unlimited suggestions and controversy, and to relieve themselves of an uneviable position, the trustees of the Lightbown bequest at Darwen decided that almshouses be erected with the money.'

Mr. Frank Cuttriss contributes to *Knowledge* the result of his observations on the spinning of a spider's web. The spider was watched from seven o'clock in the evening, but she did not begin work until two hours later, working from then continuously until 1.25 a.m., when her snare was completed. The network and the radial lines were finished by midnight, and the spiral part of the web was therefore made in a little under an hour and a half. Mr. Cuttriss gives careful diagrams illustrating the construction and progress of the web.

YORKSHIRE NATURALISTS' UNION: VERTEBRATE SECTION.

YORKSHIRE Naturalists' Union Vertebrate Section meetings were held in the Leeds Institute on November 21st, 1914. Mr. H. B. Booth, F.Z.S., M.B.O.U., was in the chair.

The Meeting heard with great regret that Mr. Johnson Wilkinson, the newly-elected Secretary of the Protection Acts Committee, had just suffered a painful bereavement by the death of his wife, and the Hon. Secretary was requested to convey to him an expression of sympathy and condolence.

The Annual Reports of the North, East and West Ridings were read by Mr. H. B. Booth, Mr. E. W. Wade and Mr. Riley Fortune respectively; for details see the Union's Annual Report in *The Naturalist*. Commenting on Mr. S. H. Smith's report on the increase of the Red-legged Partridge, Mr. W. H. St. Quintin stated that Mr. Wrigley, of Gantree, had shot 29 in one day, quite an unprecedented number for any Yorkshire area. The Corncrake in the Rillington district was decidedly on the down grade, only one brood being noted this year, against three in 1913. He was strongly of the opinion that this species suffered badly from telephone and telegraph wires. He had seen the Waxwing in South France in March, three were shot near Hyéres, one in December 1913, and two in January 1914. He regretted to say the Bearded Tit experiment at Hornsea had apparently failed.

Mr. G. H. Porritt in contradiction to Mr. Wade's report, considered 1914 a very bad insect year, so far as those species which constitute bird food are concerned.

Mr. S. H. Smith had noted while Partridge shooting that the Red-legs don't face the guns as readily as *Perdix cinerea*, and this fact may account to some extent for the great increase of the former species.

Mr. Fortune presented the General and Financial Reports of the Yorkshire Wild Birds and Eggs Protection Acts Committee, and the Yorkshire Mammals, Amphibians Reptiles and Fishes Committee for 1914.

The election of officers for 1915 was proceeded with. The question of Recorder for the York District was discussed, and Mr. S. H. Smith was appointed to that office.

On behalf of Mr. G. H. Parkin, Mr. Pollard exhibited stuffed specimens of the Common Shrew and the Water Shrew (dark variety), also Daubenton's Bat caught at mid-day on the margin of the reservoir at Coldhiendley. Mr. Booth showed a skin of the Jersey Vole sent by the late W. Cash, and detailed its specific differencies.

Mr. F. H. Edmondson handed round skins of male, female and immature male Merlins.

At the evening meeting Mr. Bolam's 'Notes on a Visit to South Wales,' were read by the Secretary.

The chief value of the paper naturally lay in the observations of the Kite, but several other points of general ornithological interest are worthy of note.

A striking scarcity of the Lapwing and Corncrake, both formerly abundant, was attributed to the Fox by a gamekeeper acquaintance, whose judgement however, may have been a little warped. During a spell of wet weather at the beginning of May, the writer had observed on two separate occasions and in two localities, an interesting feature of the Cuckoo not generally known. On each occasion the birds were seen to survey the ground from a low branch and then drop into the grass, out of which they dragged, much after the manner of the Thrush, a fairly large earth-worm. When the worm's resistance had been overcome, it was taken crosswise in the bill, given a not very forcible bite, and forthwith swallowed.

The staple food of this bird is stated in practically all text books to consist of caterpillars, and it probably has caused many field naturalists to question how, when and where these are to be obtained in the early days and weeks of the summer visit. The foregoing may offer a simple explanation.

The present precarious footing of the Kite in the Principality is difficult to explain, as within living memory the species was fairly common in some localities and received no more attention than the numerous Buzzards do now. In recent times the human element has undoubtedly contributed to the reduction. The most serious natural enemy is the Carrion Crow, which abounds there and is found nesting in close proximity to every Kite's nest, upon which it wages war. Curiously enough the Kite suffers much in comparison with the Buzzard in repelling the attacks of this Crow, and a similar contrast was noted in the hunting abilities of the two, the Buzzard being much bolder and more energetic. The nesting habits and food of both birds were detailed, as were those of the Raven.

Several rather rare species of smaller birds were observed in good numbers, such as the Woodlark, Pied Flycatcher, Green and Great Spotted Woodpeckers, and Longtailed Tit. Polecats are still fairly common, but the Marten is apparently extinct.

With reference to the Longtailed Skua obtained at Withen's Reservoir in June, 1914, as reported in *The Naturalist* for September, Mr. Pollard commented upon the unusual instance of this species appearing on the Spring migration, and announced that Mr. Parkin, who stuffed the specimen, had identified it as a female with well developed ovaries.

Mr. F. H. Edmondson gave a most interesting paper,

'Home-life of the Merlin,' illustrated with slides, the result of many hours watching and photographing from a hiding tent.

As supplementary to Mr. Taylor's paper on the same subject given at our February meeting, the notes made with regard to the feeding, etc., are of particular value, and it is hoped to publish these in an early number of *The Naturalist.*

The next paper also, 'The British Terns,' given by Mr. R. Fortune (illustrated by many fine pictures) cannot be satisfactorily dealt with in these minutes, being a most exhaustive history of the Tern family generally, and the British Terns in particular. It is hoped therefore it will receive a permanent record in *The Naturalist.*

Mr. T. Sheppard exhibited a caged specimen of a bird sold to the Hull Museum by a Halifax dealer as a Little Bunting, taken near Ripon, but doubt was expressed as to its identity and to the dealer's bona fides. The bird had not the behaviour of a newly caught wild bird and little doubt existed that the recent Yorkshire record of the Blackheaded Bunting from the same source is a similar instance of fraud.*

A. HAIGH-LUMBY, *Hon. Sec.*

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In No. 279 of the Quarterly Journal of the Geological Society, Mr. L. F. Spath has an elaborate paper on 'The Development of *Tragophylloceras loscombi* (better known as our old friend *Ammonites loscombi*).'

The fourty-fourth Annual Report of the Libraries, Art Gallery and Museums Committee of Bradford, contains a creditable list of additions to the Art Gallery; these are also particulars of a few additions to the Museum.

We have received from Capt. S. S. Flower, Giza, Egypt, a reference list of the Zoological Gardens of the world corrected to August 1st, 1914. From this it seems that there are seven in England, and one each in Ireland, Scotland and Wales.

We regret to notice the death of A. R. Hunt, F.G.S., F.L.S., who made a special study of ripple-marks, coast erosion, and raised beaches. He also contributed largely to the geology of the district in which he lived, viz., Dartmoor and Devonshire. He was 72 years of age.

From Mr. Baker Hudson we have received his 'Guide to Roman Antiquities, found within Cleveland, and now in the Dorman Memorial Museum, Middlesbrough,' (8 pp., 8vo.). It principally refers to the specimens found during excavations at the Outlook Fortress at Huntcliffe, near Saltburn.

With the January number of the *Entomologist's Monthly Magazine,* that journal commences its 51st volume, being the first of the third series. We should like to congratulate the editors and publishers on the continued prosperity of this publication. In the notes from Dr. E. Bergroth on page 16, reference is made to the specimens collected by the late George Norman, a well-known Yorkshire naturalist, and on the next page is an interesting letter from William Spence, which indicates the extent of his share of the work in the well-known Introduction to Entomology.

* See *The Naturalist* for January for details.—ED.

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THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
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AND
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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
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Prof. P. F. KENDALL, M.Sc., F.G.S., JOHN W. TAYLOR,
T. H. NELSON, M.B.O.U., RILEY FORTUNE, F.Z.S.

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YORKSHIRE BRYOLOGICAL COMMITTEE.

The next meeting will be held at Austwick, Easter week-end, April 3-6. Will members intending being present please notify Mr. C. A. Cheetham, who will make arrangements for them, and supply details of trains, etc.

Mr. George Bolam of Tyne Bridge, Alston, Cumberland, has a few remaining copies of his BIRDS OF NORTHUMBERLAND (illustrated, 726 pages), and would be glad to exchange a copy with any reader of *The Naturalist* for a copy of BIRDS OF YORKSHIRE.

BOOKS WANTED.

Quarterly Journal of Science. Set.
Bibliotheca Bradfordiensis (Catalogue of Bradford Books, etc.). 1895.
Frizinghall Naturalist (lithographed). Set.
The Field Naturalist and Scientific Record. Set.
The Journal of the Keighley Naturalists' Society. Set.
Huddersfield Arch. and Topog. Society. 4 Reports. (1865-1869).
The Naturalists' Journal. Parts 1-18.
Monthly Circular, Huddersfield Naturalists' Society. Nos. 9, 10, 11, 12, 15, 16, 17, 20.
First Report, Goole Scientific Society.
Cleveland Lit. & Phil. Society's Transactions. Science Section or others.
The Naturalists' Record. Set.
The Natural History Teacher (Huddersfield). Vols. I.-II.
The Economic Naturalist (Huddersfield). Vol. I.
The Naturalists' Guide (Huddersfield). Set.
The Naturalists' Almanac (Huddersfield). 1876.
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Keeping's Handbook to Natural History Collections (York).
"Ripon Spurs," by Keslington.
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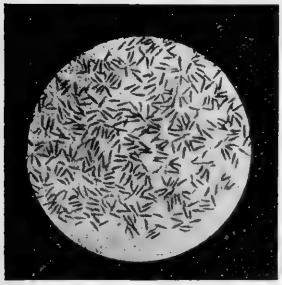
NOTES AND COMMENTS.

SEWAGE DISPOSAL.

We have been favoured with a reprint of 'A Contribution to the Biology of Sewage Disposal,' by J. W. Haigh Johnson, B.Sc., which appears in the *Journal of Economic Biology*, volume 9, No. 4, pages 105-164. It deals fully with 'Historical account of the development of the modern sewage (sprinkler) filter'; 'Organisms as an index of pollution'; 'Ecological associations and distribution of organisms in a sewage filter'; 'Some noteworthy dominant organisms occurring on sewage filters (*a*) the Sewage or moth-fly (*Psychoda*); (*b*) the water springtail Podura, *Achorutes viaticus* (L.) Tulb.; (*c*) other dominant or sub-dominant organisms.' Even in this somewhat special subject it is interesting to find that Mr.



1.—Group of insects (natural size).

2.—*Podura aquatica*, showing how the spring (s) projects backwards beyond the body. × 23.

3.—Eggs of *Achorutes viaticus* (Linn.) Tulb., showing separation of ruptured outer integument and the developing embryo.

Johnson pays tribute to the researches of the late Dr. Sorby. The paper contains a fearsome list of the more characteristic organisms, arranged according to the pollution intensity, some of the illustrations of which we are able to reproduce. It is quite possible that his lists may contain additions to our county's fauna.

BOLLING HALL, BRADFORD.

An inquiry was recently held at Bradford in reference to the application of the Bradford City Council for power to borrow £6,350 for the purchase of land adjoining Bolling Hall, and for the adaptation of that building for the purpose of a museum. The City Librarian pointed out that the new museum would contain views of old buildings and of old Bradford, portraits of local worthies, plans, manuscripts, and deeds relating to the city, a certain number of books, and a collection of relics, such as Chartist pikes and other arms, and old domestic and other articles of interest. The South Kensington Museum authorities have promised to lend the Corporation a collection

of contemporary furniture, and there would also be loans from private individuals. The Libraries Committee already had sufficient material to set the museum going on a sound basis. It was intended that the museum should be a sort of reflection of the history and antiquities of the city, and he believed the building would be opened with a "flourish of trumpets." There were precedents in other cities, he pointed out, for such a museum. In reply to the question as to whether it was robbing Peter to pay Paul, Mr. Woods stated that as a matter of fact they would be very glad to get rid of considerable material at the Cartwright Hall. We hope there will be a curator appointed to assist in the 'blowing of trumpets'!

FROGS IN COAL.

Notwithstanding the war, the newspapers evidently are able to find room for the revival of the silly old fables of frogs in coal, the *London Daily Chronicle* being the latest to succumb to the stories. It seems that Sir Francis Brain records the discovery of a live frog in the 20 inch seam in the Trafalgar Colliery. He says: 'It would be interesting if those competent to express an opinion would say how they think it can have been sustained under such circumstances, and over such a very long period—many, many thousands of years.' He also informs us that he is presenting the frog to the British Museum, where we have no doubt it will be placed in a suitable repository.

GEORGINA THOMPSON'S FROG.

This record is followed up by Georgina Thompson in the following note: 'In 1875, when my husband was Vicar of Aldeburgh, Suffolk, we were in the old Manor House while the vicarage was rebuilding. One morning I was dressing my baby in a ground floor room, and broke a large coal on the fire. Instantly there leapt out from it a black frog or toad, which began crawling on the flannel apron I was wearing. Being startled, I put the baby down, opened the window and shook the creature off. I was afterwards vexed to have done this, and went out to try and find it. Snow was on the ground, so my search was not long. I did not find it. It was as black as the coal; very thin, though rather long, and quite lively.' It is a pity the frog was not found, as the British Museum might then have had two, and put them in a pond like the proverbial gondolas! In this case it is fairly obvious, of course, that the frog had been tumbled out of his hiding place in the coalhouse and thrown on the fire, and naturally jumped off as quickly as he could.

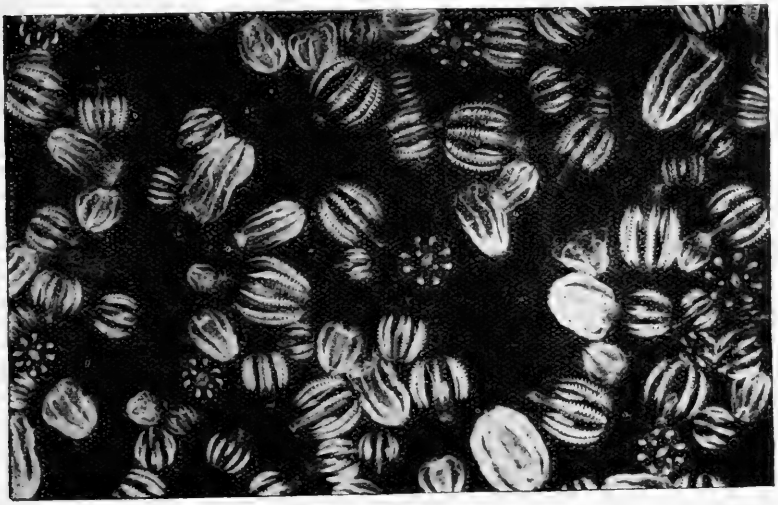
COUNTRY LIFE.

This, one of the best illustrated papers of a general type that we know, has recently paid particular attention to natural

history and scientific matters. In the three parts before us we notice articles on rock gardens, oak galls, insects, the nightingale, etc. There are also three articles by Sir Ray Lankester, entitled, 'Science at Leisure.' They deal with the large shells in the Suffolk Crag stones, etc. These are very well illustrated.

LIVERPOOL BIOLOGISTS.

Volume 28 of the valuable Proceedings and Transactions of the Liverpool Biological Society (498 pp., 21/-) has been issued. It contains the presidential address of Dr. C. J. Macalister on 'Some Relationships between Education and Co-ordination of Function.' Prof. W. A. Herdman gives his



A remarkable Plankton haul of the Ctenophore, Pleurobranchia pileus: natural size.

usually full and scholarly 'Report of the Liverpool Marine Biological Committee and their Biological Station at Port Erin' (this being the twenty-seventh); there is also the 'Report on the Investigation carried on during 1913, in connection with the Lancashire Sea-Fisheries' Laboratory at the University of Liverpool, and the Sea-Fish Hatchery at Piel, near Barrow,' by Prof. Herdman, Mr. A. Scott and Dr. J. Johnstone. The above occupies nearly 300 pages. Mr. H. C. Chadwick contributes a memoir on 'Echinoderm Larvæ.' There are numerous plates, charts, etc., and whether considered from a scientific or economic point of view, the record is a remarkable one. We are permitted to reproduce one of the illustrations.

THE AMBER TRADE.

According to *The Mining Journal*, the war is likely to have a serious effect on the amber trade, as the great bulk of supplies is derived from the deposits in the neighbourhood of Dantzig and Königsberg. The production from the Royal Amber mines in 1913 amounted to 427 metric tons, as compared with 400 tons in 1912. There is an increasing demand for raw material to the extent of 20 per cent., so much so that the price was advanced by the State factory at the beginning of 1914. In addition to the ordinary requirement for Europe and America, a good trade is done in amber beads for Asia and Africa. Some amber is found on the Baltic coast, in Russian territory, in the neighbourhood of Libau, and its occurrence has been noticed in various places in Siberia.*

THE STRIATION OF FLINT SURFACES.

In *Man*, volume 14, part 11, Mr. J. Reid Moir, who is a prolific writer on the subject, has an article on 'The Striation of Flint Surfaces.' In this he states: 'If, as I think it seems reasonable, the thin plates of shattered flint would weather out in 500 years, then these particular stones, at any rate, must have been scratched since the fifteenth century, and as we know that this country has not been glaciated since that date, ice action is accordingly put out of the question. I do not wish at this stage of my researches to put forward any definite views as to the means by which these various stones have been striated, but with these facts before us, and bearing in mind that steel will scratch flints, I consider it needful to go forward very carefully in this matter, and to realise that while moving ice, with stones in its grip, has no doubt scratched some flints found in some deposits, yet certain others found upon the surface of the ground must owe their striæ to some ordinary every day occurrence—possibly connected with agricultural operations.'

PHOTOGRAPHING BIRDS' NESTS.

In *The Animal World*, a magazine which is printed in the interests of animals, we notice that in an article by Mr. Stanley Crook on 'A British Diamond,' which is illustrated by photographs of Kingfishers and their nests, he states, 'I saw the bird fly out and carefully enlarged the hole until I was just able to reach the nesting chamber, and ascertained that the nest contained one egg. I did not visit it again for nearly a month, when I hoped to find nestlings, but my disappointment was great when I found there were still eggs in the nest and that they were stone cold. As I thought this was too good an opportunity

* See *The Quarry* for February.

to be missed, I had no compunction about digging (with the aid of a stick and my hands) until I came to the nest !' It probably was entirely due to Mr. Crook's attention to the hole in the first instance which resulted in the nest being deserted.

'THE BIRDS OF NORTHUMBERLAND.'

The accompanying illustration of the nest of the Long Tailed Tit is one of very many appearing in 'The Birds of Northumberland,' by our contributor, Mr. George Bolam. Mr. Bolam's excellent report on the 'Birds of Hornsea Mere' will

Nest of the Long Tailed Tit.

be remembered by our readers, and his Northumberland book is done in the same thorough and scientific style. It occupies 726 pages and certainly deserves every encouragement. The few remaining copies are in his hands at Tyne Bridge, Alston, Cumberland, to whom applications should be made for particulars.

CLEVELAND NATURALISTS.

We have received the Proceedings of the Cleveland Naturalists' Field Club for 1912-13, volume 3, part 2, edited by the Rev. J. Cowley Fowler.* Mr. Frank Elgee gives a detailed report of the work of the club during the two years. There are also the following interesting papers, all of which have especial local interest :—'Coast Erosion' (illustrated), by J. J. Burton; 'Record of Plants found during Excursions of the Field Club,' by T. J. Cozens; 'Coleoptera observed in

Estuarine Rocks near Hayburn Wyke, showing the uneven weathering of hard and soft bedded rocks.

Cleveland in 1912-13,' by M. L. Thompson. Mr. Burton's paper contains a summary of the Coast Erosion of the British Isles, with particular reference, of course, to Yorkshire, one of the illustrations in which we are permitted to reproduce. Bibliographers should note that although the cover bears the date 1914, the publication was not issued until early in 1915.

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Sir Henry Miers has been elected Vice-Chancellor of the Victoria University, Manchester.

* Hull: A. Brown & Sons, pages 85-146, 2/-.

NEW RECORDS AND ADDITIONAL LOCALITIES FOR THE MOSS-FLORA OF YORKSHIRE AND DURHAM.

RICHARD BARNES.

SINCE contributing the last notes on this subject, I have gathered a number of the rarer Mosses and Hepatics, several of which are new to their respective vice counties, while one—*Aplozia lanceolata* var. *prolifera*—is now first recorded for Britain.

In my visits to Thorns Gill, Blayshaw Beck, Sandwith and Harlow Moors, I was accompanied by my valued friend, Mr. Ll. J. Cocks, whose name I should like to associate with my own in regard to the records from those localities.

My sincere thanks are hereby tendered to Mr. H. N. Dixon, and Mr. Symers M. Macvicar, for their kindness in examining and verifying and in some instances in determining the more critical species contained in this list.

The V.C. number marked with an asterisk, indicates that, so far as I can ascertain, the record is a new one for the Vice County, while the plant name thus marked indicates that the record is a new one for the County as a whole.

Oligotrichum incurvum (Huds.), Lindb. Blayshaw Beck (V.C. 64).

Diphyscium foliosum Mohr. Ravensgill, Pateley Bridge (64).

Swartzia montana (Lamk.), Lindb. On a wall near Blackwell, Darlington (66). A certain amount of interest is attached to the appearance of this montane species in a locality at so low an altitude, and so well away from the river, hence my reason for including it in the present list. I have previously observed it as far down the Tees as Gainford, but only on rocks near to the edge of the river; its distribution in such instances being easily accounted for.

Swartzia inclinata Ehrh. On damp limestone ledges, Farnham, Knaresborough (*64); and by the Yore above Wensley Bridge (*65).

Seligeria acutifolia var. *longiseta* Lindb. On limestone rocks above Clapham Cave (64).

Seligeria tristicha (Brid.), B. & S. West Burton, Wensleydale (65).

Brachyodus trichodes Fürnr. On sandstone rocks, Lul Beck, Ramsgill (64).

Cynodontium Bruntoni (Smith), B. & S. Ravensgill, Pateley Bridge (64).

Dicranella crispa Ehrh. Ingleby Greenhow (62).

Dicranella Schreberi (Swartz.), Schp. Starbeck, and also at Birstwith (64).

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Dicranella squarrosa (Schrad.), Schp. Blayshaw Beck (64). In fine fruiting condition.

Dicranodontium longirostre B. & S. Wath Woods,' 1900; and also by the stream in going towards the Merryfield lead mines, Nidderdale. Although the above species has been previously recorded in this journal (April 1909, p. 144), by Mr. Cheetham, as new to the Nidd drainage area, I contributed the two above localities in July, 1908, to the list then in compilation for Dr. Lees' 'Flora of West Yorkshire.'

Fissidens exilis Hedw. Hedgebank, Rudding Park, near Harrogate (64).

Fissidens rufulus B. & S. Ling Gill and Thorns Gill, Ribblehead, and Ingleton (64). In Roxby Beck, Cleveland (*62). The latter station is a new record for V.C. 62. Mr. H. N. Dixon refers to the Ling Gill plant as 'very good *F. rufulus*,' and to the Roxby as 'being similar in character to that gathered in the Wharfe.'

Fissidens osmundoides Hedw. Ravensgill, Pateley Bridge (64). Richly fruiting.

Campylostelium saxicola (W. & M.), B. & S. Duncombe Park, Helmsley (62).

Acaulon muticum (Schreb.), C.M. Duncombe Park, Helmsley (62). I am not aware of either this species or the Campylostelium having been previously found on the Hambleton range of hills.

Phascum curvicolle Ehrh. Kirk Deighton (64); Burton Leonard (64).

Pottia recta (With.) Mitt. Kirk Deighton (64); Ripley (64).

Pottia intermedia Fürnr. Kirk Deighton (64); Blayshaw Beck (64).

Pottia lanceolata (Hedw.), C.M. Knaresborough (64); Wormald Green (64).

Tortula brevirostris Hook & Grev. On limestone marl in Grimbald's Quarry, Knaresborough (64), Burton Leonard, and at Wormald Green (64).

Tortula rigida Schrad. Kirk Deighton, near Wetherby (64).

Tortula ambigua Angstr. Very fine in the limestone quarries, at Burton Leonard (64).

Tortula marginata (B. & S.), Spruce. Rievaulx Abbey (62); in fine fruiting condition.

Tortula angustata Wils. Knaresborough (64).

Tortula mutica (B. & S.), Lindb. On tree trunk Ripley (64).

Tortula papillosa Wils. On tree near Cowton Castle (65).

Barbula lurida (Hornsch.), Lindb. By the side of the Nidd, Knaresborough (64), in fruit. A very short broad-leaved form occurs by the Tees at Rokeby, and by the Yore at Tanfield.

Barbula recurvifolia Schp. In the limestone quarry at

Kirk Deighton (64). It grows in great luxuriance by the walls in going to Greenhow Hill.

**Barbula glauca* Ryan. On limestone rocks between Richmond and Downholme (*65). A new county record.

I gathered this plant some time ago, and feeling uncertain I sent a specimen lately to Mr. H. N. Dixon, who kindly informs me that Mr. Nicholson and himself quite concur in their opinion as to its identification with the above and further, that it has only been described in recent years and has, he believes, only once been gathered in this country before, Mr. Nicholson having met with it in Sussex.

Mr. Dixon further remarks that it is very near to *Barbula rigidula* and in his arrangement would have to go as *Barbula glauca* (Ryan.), Dixon.=*Didymodon glaucus* Ryan.

Barbula sinuosa Braith. Bolton Woods (64).

Barbula gracilis Schwgr. Kirk Deighton, near Wetherby (64).

Barbula Hornschuchiana Schultz. Middlesmoor (64), with young fruit; Ripley (64); Knaresborough (64); Wormald Green (64); Burton Leonard (64); Ripon (64); Pilmoor, near Thirsk (62); Beckwithshaw, near Harrogate (64); Upleatham (62); Laithkirk (*65).

**Weissia crispa* (Hedw.), Mitt. var. *aciculata* Mitt. Deepdale Barnard Castle (*65). A new county record.

Trichostomum crispulum Bruch. In Kirk Deighton quarry (64), and very fine by the Yore at Hackfall (64).

Trichostomum crispulum Bruch. var. *nigro-viride* Braith. Thorns Gill, Ribblehead (64).

Trichostomum tenuirostre (Hook and Tayl.), Lindb. On sandstone rock, Bolton Wood (64), and in Deep Gill, East Witton (65).

Encalypta ciliata (Hedw.), Hoffm. In very fine fruit on wall near Wemmergill, Lunedale (65).

Zygodon viridissimus (Dicks.), Brown. Cotherstone, in fruit (65).

Orthotrichum rivulare Turn. Cover Bridge, in very fine fruit (65).

Orthotrichum Schimperi Hamm. On trees between Wensley and Leyburn (65). New to Wensleydale.

Orthotrichum stramineum Hornsch. In hedgerow near Bilton, Harrogate (64).

Orthotrichum tenellum Bruch. On tree near Ripley (64).

Orthotrichum obtusifolium Schrad. Reeth (65). New to Swaledale.

Discelium nudum (Dicks.), Brid. Blayshaw Beck, Nidderdale (64).

Aulacomnium androgynum (L.) Schwgr. Very abundant on hedge bank near Cattal (64).

Bartramia pomiformis (L.) Hedw. var. *crispa* (Sw.) B. & S. Ravensgill, Pateley Bridge (64).

The remarks under *Dicranodontium longirostre* apply also to the above plant, and to *Dicranella secunda* as to former records. The late John Nowell was I believe the first to record the last named for West Yorkshire.

Bryum concinnatum Spruce. Ling Gill and Thorn Gill, Ribblehead (*64). Some years ago I gathered this plant in nice condition in Whitfield Gill and noted it accordingly. In visiting the locality this last autumn, I saw it again, but in poor condition. The part where it grew appears to have altered considerably, due, no doubt to the terrific storm that passed over that part of the dale some four years ago, scouring out many of the streams in the district.

Bryum lacustre (Bland.) Brid. Birk Crag, Harrogate (64).

Bryum uliginosum (Brid.) B. & S. By stream between High Force and Langdon Beck, Upper Teesdale (66).

Bryum bimum Schreb. Hell Kettles, near Croft, Darlington (66).

Bryum pallescens Schleich. On wall near Summerbridge, Nidderdale (64).

Bryum affine (Bruch) Lindb. Quarry Moor, Ripon (64); Blayshaw Beck (64); Coatham Marshes (62).

Bryum capillare L. var *Ferchelii* (Funck.) B. & S. Below Giggleswick Scars (64) and on walls near Ribblehead (64).

Bryum obconicum Hornsch. By the Tees near Gainford (65); fruiting freely.

Bryum atropurpureum W. & M., var. *gracilentum* Tayl. On rocks in the Tees, Winston Bridge (66).

Bryum murale Wils. The distribution of this species is, I think, more general than it is usually supposed to be. About Harrogate and Knaresborough I have seen it in quite a dozen localities, and in a good few in other parts of the county. It seldom bears fruit and is, doubtless, on that account often overlooked.

I have found it with fruit in the following localities in the Nidd drainage area, viz., Stockeld Park, Kirk Deighton, and Howstean Beck, and in that of the Yore at East Witton and West Burton, and in Cleveland at Ingleby Greenhow.†

Bryum Mildeanum Jur. Thorns Gill, Ribblehead (*64).

(*To be continued*).

† A correction is needed in regard to Mr. Ingham's remarks in *The Naturalist*, June 1906, page 187, as to the above plant being new to the County. Prior to this date it had been duly noted in this journal as having been gathered by myself in two localities on the Yorkshire side of the Tees, viz., Rokeby, with fruit in good condition, *Naturalist*, May 1892, p. 153; and at Croft with male flowers, June 1897, p. 185.

DEYEUXIA NEGLECTA, KUNTH. IN YORKSHIRE.

ARTHUR BENNETT.

In *The Naturalist* for 1887 at page 201, I made some remarks on the above plant as occurring in Mr. F. J. Hanbury's herbarium from 'Castle Howard Woods, July, 1844, H. Ibbotson.' At page 273, Dr. Arnold Lees also gave some notes respecting it, doubting it as ever occurring. The plant having been found in Norfolk this year, and sent me by the finder, Mr. F. Robinson, I had cause to look up its distribution, and I came across a copy of a letter from Dr. R. Spruce to Mr. M. Slater of Malton. It seems well to print this, as Dr. Spruce could hardly have been mistaken :—

'CONEYSTHORPE, *2nd August*, 1887.

Dear Sir—If *Calamagrostis stricta* grows where it did 53 years ago, I can tell you where to find it. When you disembark at Castle Howard Station, go up Gilla Leys on the south side, near the very top (following the stream) *Trichocolea* used to grow in some abundance—perhaps you might find it in fruit. Go right on till you come to Wellburn Mill ; there on mud-capped walls used to grow the peristomirate form of *Encalypta vulgaris*. Keep by the beck, or on the hill side above it till you come to Wellburn Moor ; there you will see a bridge over the beck (Old Crambeck Bridge), do not cross it, but keep right on to Pretty Wood Gate, just within that gate going up the brook that joins Crambeck, on boggy ground, and in the Wood Ledge, used to grow the *Calamagrostis*. I had called it in my boyhood *C. lanceolata* (for I found no *C. stricta* in Smith's Compendium), but when Ibbotson was here last he told me Jas. Backhouse and (I think) Asa Gray had made it out to be the true *C. stricta*. The plant was still in some abundance when Ibbotson passed this way, and gathered some of it ; but for the last three years there has been a mania for draining on this estate, and it may have extended to the locality of the *Calamagrostis* (which the gods forefend).—Yours faithfully, RICHARD SPRUCE.'

This seems some evidence that something else besides *C. lanceolata* grew there. Anyhow, the specimens in Mr. Hanbury's herbarium are *C. stricta* not *C. lanceolata* !

Dr. Lees seems to assume in his note that some pale form of *lanceolata* may have been meant or mistaken for *stricta*, but that is not so, with the specimens I name.

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In *The Museums Journal* for February, Messrs. E. L. Gill and H. Fletcher describe their method of making plaster casts of fishes, which gives some very practical and useful hints.

THE GERMAN BOMBARDMENT OF HARTLEPOOL, WHITBY, AND SCARBOROUGH,

16th December, 1914.*

S. MARGERISON.

The following correspondence in 'The Yorkshire Post,' from the 19th to the 26th December, 1914, is worthy of preservation :—

THE SOUND OF THE GUNS.

Here at a distance of about 35 miles from the coast, it was heard most distinctly and also caused considerable vibration to the houses. A westerly breeze was blowing at the time.

Yours etc., H. B. DREW.

Sutton-on-the-Forest, Dec. 17th.

The guns were heard so very distinctly about Eavestone, Sawley, Risplith, Studley, etc., that they must have been audible considerably further to the westward. From three local sources I have heard that the pheasants were highly excited in a peculiar manner, different from that caused by either sporting guns or thunder. These places are all about 55 miles from Hartlepool, Whitby, and Scarborough.

Yours etc., SAML. MARGERISON.

Risplith House, near Ripon, Dec. 19th, 1914.

The firing was distinctly heard in Lunedale, about 50 miles due west of Hartlepool. A westerly breeze was blowing at the time, which makes it the more remarkable. I was in the Barnard Castle district, which is a little nearer, and a distinct tremor and vibration was noticeable.

Yours etc., E. HARDY.

Maylands, Garden Village, Hull, Dec. 19th, 1914.

I was on the Town Moor of Harrogate, quite close to the meteorological hut, between 8-15 and 8-20 a.m. on Wednesday, the 16th inst., when I distinctly heard several smothered reports like the sound of large calibre gunfire. I listened attentively, and the reports were again audible. I did not count the number of reports but I should think I must have heard about 20. The morning was bright and clear, with the wind about west-north-west, so far as I could remember.

Yours etc., ALISTER ALISON.

36 Harlow Moor Drive, Harrogate, Dec. 19th, 1914.

I had a man ploughing in a field in Parlington Parish who told me before dinner that he had heard heavy firing, north-east, between 8 and 9 a.m., which ended as our school bell ceased. Distance by straight line, 50 miles. Birds of all kinds in a plantation near by were greatly disturbed.

Yours etc., JNO. HEATON.

Swan Farm, Aberford, near Leeds, Dec. 21st, 1914.

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* *The Times* has since had a similar correspondence in reference to Lincolnshire, etc.—ED.

The guns were heard very distinctly at Wetherby, which is about 60 miles from Scarborough, and considerably further from Whitby and Hartlepool. The pheasants were more highly excited than ever I have seen them before.

Yours etc., H. HEBDEN.

Ingmanthorpe, Wetherby, Dec. 21st, 1914.

The firing was heard last Wednesday, the 16th inst., between 8 and 9 a.m. in Leeming Bar, Bedale, and in the parish of Thornton Watlass. The last-named place is about 47 miles from Scarborough and about 44 from Whitby. The Hambleton Hills are between these three places and the coast. The guns were also heard at a place about a mile south-west of Thornton village, and a man remarked it to a friend at the time, and also said that the pheasants were making a great noise, and showed signs of much uneasiness.

Bedale, Dec. 22nd, 1914. Yours etc., C. M.

Mr. T. Penrith, Winton, distinctly heard the East Coast bombardment, at, as nearly as he can fix it, 8-30 a.m. Winton is in Westmorland, at the western foot of the Pennines, and about half-a-dozen miles from the summit of the famous Maiden Castle Pass, though which the Darlington and Tebay railway passes.

Yours etc., JAS. SAGAR.

Winton, Kirkby Stephen, Dec. 22nd, 1914.

Guns were heard here and the same effect on the pheasants noticed. The distances are—Hartlepool 36 miles, Whitby 47, and Scarborough 54. Those from Wetherby are—Hartlepool 52 miles, Whitby 48½ miles, and Scarborough 46½ miles. Desultory firing was also heard this morning.

Yours etc., JOHN MAUGHAN.

Jervaulx, Middleham, Yorks., Dec. 23rd, 1914.

I have since learnt that the sound was heard beyond Fellbeck, in the Pateley Bridge direction, and 60 miles west of the bombarded towns. At the time it was attributed to blasting operations at the Bolton Abbey quarries. Possibly the same idea may have kept back other observations from further west. There are several places among the Pennines whence the sound of blasting is regularly coming. At Gilling West, near Richmond, the sounds were very distinctly heard, and there was considerable vibration of windows and doors; and the atmospheric waves caused similar effects at Cayton, near Ripley, in the Nidd valley district.

The distances at which the guns were heard make one interesting item in these observations, but perhaps the behaviour of the birds (and probably of other animals) is of even more concern to naturalists. The pheasants around here suddenly dropped from their perches (day had just dawned), and ran about in a state of abject terror, their behaviour being markedly different from what it is under their ordinary circumstances of fear.

Whether this indicates some abnormal excitation of such of their senses as we are capable of understanding by means

of the development of our own, or points to some special sense-organs of which we are ignorant, is a question of much interest. It is strongly held by many students, that certain animals have more than the five senses which man uses—other senses which he cannot understand simply because of his lack of them or of their development.

At any rate, the somewhat 'hysterical' behaviour of the pheasants and other birds at such a great distance from the scene of the bombardment seems noteworthy, and it would be useful to know if anything similar occurs within sound of gun-testing grounds, or in the countries which are, alas! now becoming too familiar with the booming of the great guns. Of course, the disturbance coming at the birds' awaking time counts for much, but not, I think, for all.

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We regret to announce the death of the Rev. F. H. Woods, of Bainton. A photo and notice will appear in our next issue.

We received some little time ago the *Handbook of the Amateur Camping Club* which contains numerous illustrations of the various and numerous camping equipments, as well as of many ways of preparing various appliances. It should prove most useful and interesting in camping.

With reference to our remarks in *The Naturalist* last month in reference to the Report of the Lancashire and Cheshire Entomological Society's Report, Mr. W. Mansbridge informs us that acknowledgments to this journal will be made in the preface published with the new list.

The daily press has recently had much to say about a Mastoden tooth found at Southwark, now in the London musuem. In *Nature* it is pointed out that 'if really found near Southwark, the specimen must certainly be a mammoth's tooth,' such as may be found in most museums.

At the annual meeting of the Yorkshire Philosophical Society, held on February 8th, it was announced that the president, Mr. W. H. St. Quintin, J.P., had presented to the museum a specimen of the Great Bustard, which had been killed in the East Riding of Yorkshire.

We have received *Old-Lore Miscellany of Orkney, Shetland, Caithness and Sutherland*, part 1 of volume 8, 64 pages, which contain much useful information relating to the antiquities, old-lore, etc., of the North of Britain, published by the Viking Society for Northern Research, University of London. It is illustrated.

In *British Birds* (Vol. 8, No. 6) is a well illustrated article on 'Cormorants in Norfolk,' by E. L. Turner. In No. 7, W. Farren writes on 'Feeding Habits of the Sparrow Hawk,' and the editor gives remarkable results of his bird-marking scheme; one ornithologist alone is credited with ringing 2,521 birds! There are notes on 'Probable Yellow-browed Warblers in Nottinghamshire'; 'White's Thrush in Northumberland,' etc.

At a recent meeting of the *Lancashire and Cheshire Entomological Society*, Mr. W. Mansbridge read a paper entitled, 'Silverdale as a Collecting Ground.' He gave a brief survey of the geology and flora of the district, and enumerated a large number of local species of lepidoptera, generally rare in the north of England, which had been recorded from that favoured area. Many of these however had not been reported for a couple of decades or longer, and members were urged to endeavour to confirm such records as *L. corydon*, *T. betulæ*, *P. egeria*, *E. hyperanthes*, *L. minima*, *S. malvæ*, *S. anomala*, *A. marginepunctata*, *L. olivata* and *E. tæniata*; all of which had been recorded some thirty years ago.

RECENTLY DISCOVERED FUNGI IN YORKSHIRE—VIII.

C. CROSSLAND,
Halifax.

THE following is the eighth supplementary list of additions to our knowledge of fungi found in Yorkshire since 1905. It enumerates 51 species, all, with three exceptions, discovered during 1914. Four are new to the British flora. Upwards of half are the produce of Mulgrave Woods. The remainder were found in various parts of the country, notably Hawkswick, Buckden, Grassington, etc., by the present chairman of the mycological committee, Mr. Harold Wager. Others were met with at the ordinary Union excursions, particularly Filey (*The Naturalist*, 1914, p. 253), and Eskdale (loc. cit., pp. 319-322).

Many have been temporarily entered in *The Naturalist*, but several have not, hence it is considered advisable to include all the year's discoveries in one article for the convenience of future mycological students. The words, 'To precede,' and 'To follow,' accompanied by figures enclosed in brackets, indicate the sequence of the species as followed in the Yorkshire Fungus Flora.

At the close of 1914 the known fungus flora of the county numbered 3051.

There are two corrections necessary. (See below).

Five additions to host-plants were recorded for the county during the year.

NEW TO BRITAIN.

LACTARIUS LIVIDUS Zamb. [To follow 812].

N.E.—Mulgrave Woods. F.F. Oct. 1914. 'Nat.' p. 382. The following is a short description as given in Massee's European Agaricaceæ, p. 67.

'*Pileus convex, then plane or depressed, not distinctly zoned, pale livid, centre fuscescent, visid* (?); *gills sub-decurrent, pale livid, crowded*; *stem livid, solid, curved*; *milk white, acrid.*'

CORTICIUM MICROSPORUM Karst. [To precede 1167].

N.E.—Mulgrave Woods. On decaying wood. Myc. C., June, 1914. See 'Nat.' p. 252 for description and note.

PENIOPHORA PALLIDULA Bres. in Bourd. and Galz. Bull. Soc. Myc. Fr. 1912, p. 390. Certe Miss E. M. Wakefield.

'*Effused, cream to alutaceus in colour, when fully developed somewhat fleshy and often granular, not unlike Grandinia granulosa. Hymenium densely hispid under a lens. Hyphae of subiculum closely agglutinated cystidia arising from base, smooth, cylindrical, thin walled, usually more or less septate*; *apex obtuse, sometimes expanded slightly into a globular head, coated exter'ally with a resinous secretion*; *average measurements*, 80-90 × 4-6μ.; *spores elliptical, often guttulate*, 4-6 × 2-4μ.

1915 Mar. 1.

Occasionally small encrusted cystidia like those of Hydnum alutaceum are present, and it is possible that this plant may be a young state, or a corticioid form of that species.'

N.E.—Mulgrave Woods. Sep. 1913, and June 1914.

Miss Wakefield also received specimens from Rev. W. L. W. Eyre, Alresford, Hants. April, 1914, on fir.

TAPHRIDIUM UMBELLIFERARUM Karst. [To follow 2155].

N.E.—Mulgrave Woods. On *Heracleum*. F.F. Oct. 1914. 'Nat.' p. 252.

NEW TO YORKSHIRE.

To save repetition in the name of locality it may be stated that the 19 species and var. immediately following were all found in Mulgrave Woods, either in June or October, 1914. See 'Nat.' pp. 251-2, and 380-386.

TRICHOLOMA LORICATUM Fr. [To follow 109].

PHOLIOTA LUXURIANS Fr. [To follow 401].

PHOLIOTA SUBSQUARROSA Fr. [To follow 405].

RUSSULA CHAMAELEONTINA Fr. [To follow 898].

BOLETUS (GYRODON) McQUEENII, Mass. [To follow 999].

EICHLERIA DEGLUBENS (B. & Br.)

On rotting branch. Certe Miss E. M. Wakefield, Kew. See 'Nat.' 1914, p. 252 for synonyms. Was also found in Mulgrave Woods in May, 1912, but not then recorded. Position uncertain but somewhere in the group Thelephoraceæ. See also 'Notes on the Thelephoraceæ, Trans. Brit. Myc. Soc., 1913,' p. 305.

GALERA HYPNORUM var. SPHAGNORUM Fr.

DAEDALEA VERMICULARIS Pers. [To follow 1094].

On rotten wood and soil.

TOMENTELLA RUBIGINOSA (Bres.) V. H. (= *Hypochnus rubiginosus* Bres.). Certe. E. M. Wakefield.

On rotting wood. [To follow 1200].

CONIOPHORA BERKELEYI Mass. [To precede 1205].

On decorticated wood.

GYROCEPHALUS RUFUS Bres. [To be placed near 1272].

On piece of rotting branch, June.

RHOPOGRAPHUS PTERIDIS Fckl. [To follow 1502].

On *Pteris aquilina*, June.

CENANGIUM LEONINUM Cke. and Mass. [To precede 2102].

On hard decorticated wood, June.

PHACIDIUM MINUTISSIMUM Auers. [To follow 2139].

On dead oak leaves, June.

PERONOSPORA ALTA Fckl. [To follow 2188].

On living leaves of *Plantago lanceolata*.

CONIOTHYRIUM CONCENTRICUM Sacc. [To follow 2240].

On decaying *Aloes*. June.

PHLYOTÆNA VAGABUNDA Desm. [To follow 2264].

On dead thistle, June.

RAMULARIA VIOLAE. Trail in Scott. 'Nat.' IV. p. 74 (1889); Tr. B.M.S., Vol. III., Part 2 (1909), p. 121.

On living Viola sp. Accidentally omitted from the Mulgrave list for October.

CLADOSPORIUM FASCICULARE Fr. [To follow 2401].

On dead leaves, June.

CERCOSPORA CALTHÆ Cke. [To precede 2418].

FOUND IN OTHER PARTS OF THE COUNTY AS FOLLOW:—

TRICHOLOMA COLLOSUM Fr. [To follow 91].

Mid. W.—Buckden Wood, Aug. 1914. H.W.

TRICHOLOMA GLAUCOCANUM Bres. [To follow 129].

Mid. W.—Hubberholme Woods, Aug. 1914. H.W.

CLITOCYBE SUAVEOLENS Fr. [To precede 165].

Mid. W.—Grass Wood, Grassington, Aug. 1914. Odour of aniseed. H.W.

COLLYBIA HARIOLORUM (Bull.) [To precede 183].

Mid. W.—Grass Wood, Aug. 1914. H.W.

MYCENA PELTATA Fr. [To precede 240].

Mid. W.—Among moss, Buckden Wood, Aug. 1914. H.W.

PLEUROTUS PETALOIDES (Bull.) [To precede 305].

S.W.—Longwood, Huddersfield, Sep. 1912. A. Clarke.

Several specimens growing out of the wood lining of a domestic washing machine, in use only a fortnight previously. Specimens near 4 inches tall. Was accidentally omitted from batch No. VI.

ENTOLOMA EROPHILUM Fr. [To follow 337].

Mid. W.—In mountain pasture near Kettlewell, Aug. 1914. H.W.

ENTOLOMA PULVEREUM Rea. [To precede 348].

N.E.—Eskdale Exc. ('Nat.' 1914, p. 321).

INOCYBE MARITIMA Fr. [To follow 426].

N.E.—Eskdale Exc. ('Nat.' 1914, p. 321).

INOCYBE RHODIOLA (Bres.) Mass. Monograph of the genus Inocybe. Annals of Botany, 1904, p. 486. 'Mass. Eur. Agaricaceæ,' p. 150. [To follow 427. Y.F.Flo].

N.E.—Among grass, roadside. Forge Valley, Scarborough, Sep. 1914. A. E. Peck.

Only one previous British record. The Hazlemere Foray, 1905. Brit. Myc. Soc. Trans. 1906, pp. 101 and 128.

INOCYBE MARGARISPORA Berk. [To follow 440].

N.E.—Eskdale Exc. ('Nat.' 1914, p. 321).

INOCYBE BRUNNEA Q. [To follow 443].

Mid. W.—In a wood near Buckden, Aug. 1914. H.W.

HYGROPHORUS (Cam.) NEMOREUS Fr. [To precede 774].

Mid. W.—In pasture, Penyghent, Aug. 1914. H.W.

Lactarius retisporus Mass. [To follow 839].

N.E.—Eskdale Exc. (' Nat.' 1914, p. 321).

S.W.—Found also at Hebden Bridge by Miss C. E. Andrews, Oct. 3rd, 1914. Miss Andrews forwarded the specimens to the Mycological Meeting then being held at Sandsend.

Boletus aestivalis Fr. [To procede 970].

N.E.—Eskdale Exc. (' Nat.' 1914, p. 321).

Uromyces flectens Lagerh. [To follow 1302].

S.E.—On *Trifolium repens*. Filey Exc. (' Nat.' 1914, p. 253). T. B. Roe.

' Differs from *U. trifolii* in the larger sori, and in having only the Teleutospore stage.' These differences were only discovered by M. Lagerheim in 1909.

Uromyces caryophyllinus Wint. [To follow 1312].

N.E.—Hackness Hall. On *Dianthus caryophyllus*. In green-house, April 1914. T. B. Roe.

Puccinia Acetosæ Körn. [To follow 1354].

N.E.—Uredospore stage on *Rumex acetosa*. North Cliff, Scarborough, June 1914. Coll. C. W. Horrell, per. T. B. Roe.

Mucor circinelloides Van Teigh. [To follow 2163].

S.W.—Wakefield, J. W. H. Johnson. Frequently developes in subcultures of aquatic fungi. ' Nat.' 1915, p. 48.

Saprolegnia sp. (?). [To follow 2194].

S.W.—Attacking fish in Lake, Thornes House, Wakefield. ' Nat.' 1915, p. 48. Also in R. Don, and at Wrenthorpe, Wakefield, Dec. 1910. J. W. H. Johnson.

Oöspora lactis Sacc. [To follow 2299].

Mid. W.—Burnsall Exc. (' Nat.' 1913, p. 274).

Monilia variabilis. [To follow 2304].

Mid. W.—Burnsall Exc. (' Nat.' 1913, p. 274).

Aspergillus fumigatus Fres. [To follow 2317].

S.W.—Developed on culture plate Wakefield after inoculation with mud from R. Don, Jordan Dam, and Tinsley, May, 1914. J. W. H. Johnson. ' Nat.' 1915, p. 48.

Penicillium olivaceum. [To follow 2321].

Mid. W.—Burnsall Exc. (' Nat.' 1913, p. 274).

The three Burnsall species were accidentally omitted when list VII. was compiled.

Fusarium aurantiacum Sacc. [To follow 2470].

S.W.—Warley, Halifax, Oct. and Nov. 1912. J. W. H. Johnson. ' Nat.' 1915, p. 48.

Sachsia suaveolens Lind.

S.W.—Developed on sub. culture of material from Greetland near Halifax, January 1912, Wakefield. J.W.H.J. ' Nat.' 1915, p. 48.

Dematium pullulans Fres.

S.W.—Treeton, May 1912. Developed on subculture of material from Treeton. J.W.H.J. ' Nat.' 1915, p. 48.

Leptomitis lacteus Ag.

Mid. W.—R. Nidd, Knaresborough, 1910.

S.W.—Sour pasture, Doncaster, Ap. 1910; R. Don, Ickles Bridge, May, 1910; Holme Shay, Bradford, Feb. 1912; Halifax, Oct. 1912; Wrenthorpe, Wakefield, 1914. J.W.H.J. 'Nat.' 1915, p. 48.

Often referred to as a *Sewage Fungus*.

ADDITIONAL HOST-RECORDS.

Puccinia menthæ.

N.E.—Found on young stoloniferous plants of *Ajuga reptans* in Mulgrave Woods, June 1914. 'Nat.' p. 252. The only previous record for *P. menthæ* on *Ajuga reptans* is by Johnston in 'Flora of Berwick,' Vol. 2, p. 127.

Puccinia caricis Reb.

S.E.—Uredo-stage on *Carex acutiformis*.

Filey Exc. ('Nat.' 1914, p. 253). T. B. Roe.

Cystopus candidus Lév.

N.E.—On *Arabis alpina*. Garden, Sandsend, June 1914. 'Nat.' p. 282.

Protomyces menyanthes De By.

N.E.—On *Menyanthis trifoliata*. Throxenby Mere, near Scarborough, 1911. T. B. Roe.

Mid. W.—Austwick Bog, near Clapham, 1912. M. Malone.

S.E.—Filey Exc. ('Nat.' 1914, p. 253). T. B. Roe.

The only record previously published in the Yorkshire Fungus Flora is on *Comarum palustre*.

Darluca filum Cast.

N.E.—Parasitic on the Aecidium stage of *Puccinia primulæ* in Mulgrave Woods, June 1914. 'Nat.' p. 252.

CORRECTIONS.

Agaricus bernardii Quel. *The Naturalist*, 1913, pp. 24-5. This species was first discovered as British in Oct. 1910, on the edge of the cliffs near the sea, Bettyhill, Sutherlandshire. (Trans. B.M. Soc. Vol. III., Part 4, p. 295). This was overlooked at the time Mr. Hebden found the specimen recorded as above. It is therefore new to the county only.

Ascobolus stictoideus Speg. was published in *The Naturalist*, 1900, pp. 8 and 179, also in the Yorkshire Fungus Flora, p. 298, as a first British record. A record of the species for Orkney by W. Phillips has recently been found in *The Scottish Naturalist*, 1891, pp. 90-91. Therefore our Halifax record is not the first British as we thought, but new to the county only.

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The 36th Annual Report of the *St. Helen's Museum* contains an illustration of a case of corals presented by the late John Morgan.

LESTEVA LUCTUOSA, FAUV.

A SPECIES NEW TO ENGLAND.

J. W. CARTER, F.E.S.

At a meeting of the Entomological Section of the Yorkshire Naturalists' Union, held at Leeds on the 31st October last, I exhibited examples of a species of *Lesteva* which I had tried in vain to identify with any of the species described in Vol. 2 of Fowler's *British Coleoptera*. It was obviously in some respects closely related to *L. pubescens* Mannh. Mr. Thompson kindly gave me a specimen of *L. pubescens*, when I saw at once that it was very different. I therefore sent a specimen to Mr. J. R. le B. Tomlin, M.A., F.E.S., who kindly examined and returned it as an undoubted specimen of *Lesteva luctuosa* Fauvel, a species introduced to the British fauna by Mr. Donisthorpe in *The Entomologist's Record*, 1911, p. 301, on a single specimen taken by himself ' in the Isle of Eigg, a small island near the Isle of Mull, in the inner Hebrides, off the west coast of Scotland.' On reference to Fauvel's original description—translated in the above-named journal by Mr. Donisthorpe—there can be no doubt of the accuracy of Mr. Tomlin's determination, and as Mr. Donisthorpe remarks, ' the contrast between the yellow tarsi and red apex of the tibia, and the dark legs is most striking,' and it is very different in other respects from any of our British species. I took my specimens in July, 1913, in a mountain stream near Malham, in West Yorkshire. They were closely attached to the underside of stones—just as one finds *Dianous*—at the bottom of the stream in six or eight inches of water. There are evidently no records since Mr. Donisthorpe's original specimen. Fauvel regards it as ' very rare, under refuse and stones, half submerged on the borders of torrents in the mountains.'

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We see an announcement of a book by Sir E. Ray Lankester, entitled, ' Diversions of a Naturalist.' With this author's extensive experience, the book ought to be particularly interesting.

The January number of the Transactions of the Institute of Marine Engineers contains an interesting paper on ' Terrestrial Magnetism,' by Mr. A. N. Somerscales, of Hull. It is well illustrated.

We have received the Inaugural Address of the President, W. A. Evans, to the members of the *Leicester Literary and Philosophical Society*, October 5th, 1914, on ' Wheat, and its Relation to the Present Crisis.'

On January 21st, Mr. T. Sheppard delivered a lecture to the Royal Geographical Society on the ' Geography of East Yorkshire, as shown by Maps.' It was illustrated by a large collection of maps and charts indicating changes in the area, dating from the time of Henry VIII. At the request of the president, Mr. Douglas Freshfield, these were allowed to remain on exhibition at the Society's rooms, Kensington Gore, in order to give the Fellows an apportunity of examining them.

YORKSHIRE ENTOMOLOGY IN 1914.

THE members of the Entomological Section of the Union met on October 31st, 1914, in the Leeds Institute. Mr. G. T. Porritt presided. The following were shown. A fine gynandromorphous specimen of *Ocneria dispar*, right side ♀ and left side ♂, by Mr. G. B. Stanger; a fine series of *Vanessa antiopa* of continental origin, by Mr. W. Barraclough; red and yellow forms of *Arctia caia*, *Callimorpa hera*, and *C. dominula*; fine *fasciata* forms of *Spilosoma lubricipeda* from a Scarborough ♀; buff *Spilosoma mendica* ♂ specimens from the Colne Valley, Yorks., and white spotted ♂ specimens from Kent; white and yellow spotted *Orgyia antiqua* from West Riding localities; a fine suffused ♂ *Bombyx* var. *callunæ*, Penistone Moors, and *Lycæna corydon* var. *semi-syngrapha*, from Hertfordshire, by Mr. B. Morley; fine *Abraxas grossulariata* vars. *nigro-costata* and *nigro-sparsata* from wild Huddersfield larvæ this year, by Mr. G. T. Porritt, who also showed two species of new Yorkshire Neuroptera, *Tæniopterx trifasciata* and *Nemoura inconspicua*. *Sirex juvencus* ♀ taken at Middlestown, near Wakefield, by Mr. J. Hooper; *Periplaneta americana* and *P. australasiæ* from Keighley, and *Mutilla europæa* from Scotland by Mr. Rosse Butterfield.

The exhibits of Coleoptera included:—*Monochammus sartor*, L., ♂, taken alive in a shed at Keighley Railway Station, Mr. Rosse Butterfield, ♀ dug from a stump in a garden at Middlestown, near Wakefield, ♀ e. coll. the late W. Talbot of Wakefield, without locality, but probably local; *M. sutor* L., ♀, taken alive at Carlton Main Colliery, near Barnsley, Mr. E. G. Bayford; *Anchomenus versutus* Gyll, Ryhill reservoir; *Lesteva* (?) sp., by Mr. J. W. Carter; *Notiophilus biguttatus* F., non-metallic, alpine form, by Mr. W. Falconer; *Acupalpus exiguus* Dej., *Anacaena bipustulata* Steph., *Homalota cuspidata* Er., *Philonthus splendidulus* Grav., *Haploderus caelatus* Gr., *Bagous limosus* Gyll., *Hylastes palliatus* Gyll., *Trypodendron domesticum* L., *T. quercus* Eich., (?) *Xyleborus dryographus* Ratz., all from the Doncaster district, by Dr. H. H. Corbett.

Mr. M. L. Thompson showed from the Cleveland district:—

Haliplus striatus Sharp.
Cercyon nigriceps Marsh.
Ocyusa incrassata Muls.
Homalota eremita Rye.
Gyrophaena laevipennis Kraatz.
Myllaena elongata Matth.
Heterothops dissimilis Grav.
Quedius auricomus Kies.
Lesteva punctata Er.
Homalium iopterum Steph.
Choleva morio F.
Neuraphes elongatulus Müll.
Scydmaenus scutellaris Müll.
Bythinus puncticollis Denny.
Ptenidium intermeduim Wank.
Epuraea florea Er.
Meligethes ovatus Sturm.
Chalcoides helxines L. v. *fulvicornis* F.
Rhynchites cupreus L.
Anthonomus conspersus Dest.

Judging from the reports submitted by various members, the season, generally, has not been a good one for lepidoptera, with a few exceptions species have not appeared commonly. Light has not attracted much, and 'sugar,' although never a great attraction, has never been a failure until the latter part of the season, many late autumn species were entirely absent. Spring larvæ were common enough, *Agrotis agathina* and *Xanthia citrago* very common; about a score *Xanthia aurago* larvæ were found in sycamore buds in Deffer Wood, where the species must now be considered established.

The exceptions to the general paucity of the perfect insects were the abundance of *Brephos parthenias*, *Eupithecia castigata*, and its black variety, and *Melanippe hastata* in the Wakefield district, the last also appeared in some numbers at Edlington. In birch woods in the West Riding *Orthosia suspecta* was very common at the end of July. On the moors in the West Riding during August and September the following species appeared in vast numbers, *Cidaria populata*, *C. testata* (of which many were of an unicolorous purple form), *Oporabia filigrammaria*, *Celæna haworthii*, *Hypsipetes sordidata* in great variety, with many red forms. *Cloantha solidaginis* swarmed on the flowers of *Juncus*, six in one instance were noticed feeding on one flower head.

Pupæ of *Hydræcia petasitis* were dug freely from about the roots of butterburr in the Hudderfield district in the middle of August.

Acronycta alni, *A. leporina*, and *Cymatophora fluctuosa*, were taken during June in the Wakefield district.

Melanism has not been a pronounced feature of the year. Dry seasons seem to arrest the progress of this phenomenon. Such species as *Agrotis agathina*, *Boarmia repandata* and *Cleoceris viminalis* in the West Riding have practically become entirely melanic races, but they did not appear as intensely black as in previous years. Such species as *Acronycta psi*, *A. rumicis*, *Polia chi*, *Seodiona belgiaria*, *Ematurga atomaria* and *Xylophasia polyodon*, all of which usually have a good sprinkling of black or very dark specimens amongst them, this season have not given the same proportion of melanism either in numbers or intensity. With *Polia chi* even the variety *olivacea* was scarce.

Mr. G. T. Porritt reports that he found the *Polia flavocincta* at Bridlington to be quite the ordinary pale type, and not of the dark form which alone seems to occur in South-West Yorkshire. He also has an interesting notice of the abundance of *Pyrameis cardui* at Bridlington, in the 'Entomologist's Monthly Magazine' of November, 1914, to which reference should be made.

Dr. G. W. K. Crosland took *Tinea fulvimitrella* in Lepton

Wood, Huddersfield, a new and very interesting record for the district. Mr. T. Ashton Lofthouse writes:—He first noticed *Dasycera sulphurella* and *Incurvaria muscalella* flying freely in the sunshine in his garden at Middlesborough about the middle of April. *Cemiostoma laburnella* occurred about the end of April and was noticed again in August. It seems to be very plentiful in this district on laburnum, the foliage of which is very much disfigured by the mines of the species. In early June *Adela rufimitrella* was noticed at Ingleby Greenhow and near Northallerton. On June 13th *Mixodia schulziana*, *Tortrix viburnana*, *Phoxopteryx myrtillana*, *Adela fibulella*, *Micropteryx calthella*, *M. sepella* and *M. aureatella*, *Tinea weaverella* and *Argyresthia atmoriella* were noticed at Great Ayton, *Dicrorampha herbosana* occurred at Redcar, Middlesborough, Saltburn, and Sandsend during June and July. *D. plumbagana*, Sandsend, and *D. plumbana* at Saltburn and Sandsend, and a single specimen of *Stigmonota orobana* at Sandsend on June 20th. *Ephippiphora brunnichiana* flying freely in sunshine about coltsfoot in Kilton Woods on July 4th, on which date *Cemiostoma wailesella* was taken about *Genista tinctoria* at Saltburn, this species appears to be an addition to the Yorkshire list. *Amphysa gerningana* and *Cemiostoma spartifoliella*, Lealholm on July 11th. *Cerostoma sequella* two specimens at Kildale on July 20th, and a single specimen at Sleights on August 3rd. *Xanthosetia zoegana* at Saltburn on August 14th; *Peronea comparana* at Ingleby; *P. sponsana* and *Argyresthia semitestacella* about beech at Eston in September and *Ephippiphora similana* about birch in the same locality. About the middle of October *Exapate congelatella* occurred freely in a restricted locality on the Moors near Battersby, flying in the sunshine about 2 p.m. Mr. Lofthouse also took the following insects last year, 1913, that have not been previously recorded for Yorkshire:—*Micropteryx sangii*, near Kildale in May; *Cedestis gysselinella*, Great Ayton end of July; and the following of which there are few Yorkshire records:—*Nemotois capriacellus*, Great Ayton (only one previous Yorkshire record), *Incurvaria œhlamannella*, Great Ayton, *Brachmia mouffetella*, and *Bucculatrix cristalella*, Kildale.

For further particulars of the work of this Section, see the annual report in *The Naturalist*, for January, 1914.

Hymenoptera, Diptera and Hemiptera.—Besides the information in the Annual Report in *The Naturalist* last month Mr. H. Walch writes to say that he has taken a queen *Vespa germanica* at Halifax, after several years' search.

An ichneumon which Mr. G. T. Porritt took in his garden at Elm Lea, Dalton, Huddersfield, has been named by Mr. Claude Morley as *Tryphon trochanteratus*, this, as far as is

known, is new to the County list. On the occasion of the Union's excursion to Knaresborough at Easter, he obtained *Ophion obscurus* Fab. Mr. Porritt observes with regard to *Stenichneumon trilineatus* Gmel., which he usually breeds in plenty, some years in abundance, from wild larvæ of *Abraxas grossulariata*, was this year apparently quite absent. Out of considerably over 6,000 wild larvæ he did not this year breed a single ichneumon of any description.

Not much work has been done in the Saw-flies. Mr. Porritt reports that the gooseberry sawfly, *Pteronus ribesii* has been very destructive in gardens in the Huddersfield district, quite defoliating many bushes. Two saw-flies from the Keighley neighbourhood are apparently additions, while several interesting species have been found in new localities.

In the November number of *The Naturalist*, Mr. Percy H. Grimshaw gives a detailed acocount of a new Yorkshire gall-midge, *Oligotrophus ventricolus* Rübs. Mr. Grimshaw records another new dipteron, *Acletoxenus formosus* Leow., from Burley-in-Wharfedale. *Empis tessellata* Fab. ♀ has also occurred at Keighley. Mr. Porritt mentions that the dipterous parasite of *A. grossulariata* (*Phryxus vulgaris*), appeared in very small numbers this year. It is usually very abundant.

No observations of any moment appear to have been made with regard to *Himiptera* and active workers in this order are needed. The new species above-mentioned have been identified and confirmed by the Committee's honorary referees, to whom grateful thanks are due.

B. Morley.

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The Proceedings of the Cheltenham Natural Science Society for the session 1914-3 (N.S. vol. 2, pt. 3, pp. 103-142, 1/-), are chiefly occupied by the address of the President (Dr. E. T. Wilson) on 'The Long-Barrow Men of the Cotswolds.' It is reprinted from the 'now defunct' newspaper, *The Examiner*.

From the **Hertfordshire Natural History Society and Field Club** we have received volume 15, part 4 of its Transactions, edited by Mr. John Hopkinson (pages 193-272 and i.-lxviii.) The volume includes the following notes of distinctly local interest:—'*Testacella scutulum* in Hertfordshire,' and 'The Palmated Newt in Hertfordshire,' by G. Oldham; 'The Climate of Hertfordshire,' 'The Weather of the year 1913 in Hertfordshire,' and 'Observations in Hertfordshire,' by J. Hopkinson; 'Birds observed in Hertfordshire,' by William Bickerton; 'Botanical Observations in Hertfordshire,' by E. J. Salisbury; '*Acroloxus lacustris* in Hertfordshire,' by E. Popple; 'Geological Work in Hertfordshire,' by H. Kidner. There is also an interesting classified subject-index to the principal contents of the Transactions for the 40 years, 1875-1914, under the following headings: 'Topography,' 'Geology,' 'Hydro-Geology,' 'Meteorology,' 'Phenology,' 'Biology,' 'Botany,' 'Zoology,' 'Archaeology,' 'Physical Science,' 'Miscellaneous.'

YORKSHIRE'S CONTRIBUTION TO SCIENCE.

(Presidential Address to the Yorkshire Naturalists' Union, delivered at the University, Leeds, 5th December, 1914.).

By T. Sheppard, F.G.S.

(*Continued from page 77*).

MORE MAGAZINES.

The Naturalists' Monthly: A Journal for Nature-Lovers and Nature-Thinkers.

This publication is a large 4to much resembling 'Knowledge' in appearance. It was edited by Dr. J. W. Williams, M.A. The first number appeared in September, 1887, and contains 20 pages with three columns to the page, the last page of No. 6 being 120. The first paper is by our contributor, the Rev. Hilderic Friend, and among other contributors we notice J. R. V. Tomlin, Dr. Dallinger, and other northern writers. The publication does not seem to have lasted long, my set ending with vol. I, No. 6, for February, 1888, which number contains the additional name of B. Middleton Batchelor, as sub-editor. The journal was published by Walter Scott, London, at 6d. a month.

The Birmingham Naturalists' Gazette.

was published in June, 1882, vol. I., No. 1 (8 pages, 4to, 3 columns to a page), being edited by W. Harcourt, Bath. It was published monthly, and was sold at one penny, the first six parts forming Volume I. In January, 1883 appeared vol. 2, No. 7,* though the paging was from 49-56. The publication then apparently ceased, and the seven parts were bound up and sold as 'The Birmingham Naturalists' Gazette, and Magazine of the Birmingham Naturalists' Field Club, . . . 1882 June to 1883 January. Price one shilling and sixpence.' It contained many northern items and interesting advertisements of old magazines, etc. In September, 1882, Mr. H. B. Thornton gave an account of the Whitby Naturalists' Field Club. There were also reports from Sheffield, Barnsley, etc.

This publication was followed by—

The Naturalists' Gazette.

London. W. P. Collins." Vol. I., No. 1 being dated January, 1889. It was foolscap in size, containing 8 pages matter and 4 pages advertisements, 3 columns to a page, and was sold at one penny. By December, part 12 concluded vol. I. (at page 96).

* This one number was called *The Naturalists' Gazette.*

January, 1890, saw vol. 2, No. 1, and by December, 1890, vol. 2, No. 24 appeared—the last page (without the advertisements) being No. 96. The journal continued until July, 1891, when vol. 3, part 31 was published, apparently the last. The large proportion of full-page Birmingham advertisements indicated its source. With No. 9 the London publisher was changed to E. W. Allen, and by No. 20 'Birmingham: The Naturalists' Publishing Company' was added. There is no doubt that the journal was a wonderful pennyworth. Many northern naturalists contributed to its pages.

The Field Club.

In 1890 appeared the first volume of *The Field Club*, edited by the Rev. Theodore Wood, and published by Elliot Stock. It was apparently issued in monthly parts of 16 royal octavo pages each. Generally it was 'popular' The names of many Yorkshire contributors appeared in its pages, and the magazine contained a record of meetings, etc., of various scientific societies in the county. One of the earliest articles is an account of the Huddersfield Naturalist Society and its work, by S. L. Mosley. Vol. I. contained 190 pages; vol. II., 1891, 190; vol. III., 194; and vol. IV., 140. With the final part of vol. IV. we find: 'We much regret to inform our readers that, with the present issue, *The Field Club* will cease to exist as a separate magazine. Arrangements have been made, however, for its incorporation with *Nature Notes*.'

The Field Naturalists' Quarterly.

In February, 1902, was published the first number of a substantial quarterly, of 78 octavo pages, at half a crown a part; 4 parts to the volume. It was edited by Dr. Gerald Leighton and published by Blackwood of Edinburgh.* The journal was 'devoted to zoology in all its branches, botany, archæology, folk-lore, and all subjects worked by field naturalists and kindred societies.' Many prominent naturalists were contributors, including Yorkshiremen. Vol. I. contained 340 pages; vol. II. (1903), 365 pages; and vol. III. (1904), 382 ppages. Nothing was published after part 12.

The Naturalist's Monthly Review.

In April, 1901, appeared Vol. I., No. 1, of 'The Naturalist's Monthly Review of New Books, Publications, Records and Captures, Sales and Wants, etc.' The first part (4 pages) was not paged; No. 2 was paged 1-4; No. 12, for March, 1902, contained (including Index of Contents) pp. 73-80. The publication then ceased, and was followed by:—

* Half way through the second volume the publishing was undertaken by G. A. Morton, Edinburgh.

The Naturalists' Quarterly Review.

In December, 1905, was published by J. and W. Davis, of Dartford, vol. I., part 1, of 'The Naturalists' Quarterly Review' (New Series, 8vo, 32 pages, 7d.). By September, 1906, No. 4, completing vol. I., was issued (128 pages). From December, 1906, to September, 1907, pages 5-8 appeared, forming vol. II. The publication then ceased. It was apparently a dealer's venture.

The Journal of Natural Science.

This is referred to under the head of 'Hull Junior Naturalists' Society.' Vol. 1 No. 1 (8vo, pages 1 to 32) was for April-June, 1911, and vol. 1 part 2, for July-September, 1911 (pages 33-58) appeared on November 4th; the publication then ceased.* Besides various notes on natural history it contained 'Photographic and Philatelic Notes.'

Science Gossip.

Though not bearing directly upon our county, Hardwicke's Science Gossip, as it was familiarly known (being published by Hardwicke, of Piccadilly), was so persistently subscribed to by almost every naturalist, that it must take a place in our review, especially as many Yorkshire naturalists were contributors. It was a quarto magazine in double columns, was well illustrated, and appeared monthly. The first volume, edited by M. C. Cooke, appeared in 1865, and from then it regularly appeared until 1902; up to 1892 being bound in the familiar and somewhat gaudy blue cloth covers. Cooke ceased his editorial duties in 1872, and was succeeded by J. E. Taylor from 1873 until volume 29 in 1893.

It was published by Hardwicke until 1875; by Hardwicke and Bogue until 1878; by David Bogue until 1882, and by Chatto and Windus from 1883 to 1893.

In 1894 a new series commenced, under the editorship of J. T. Carrington, the publishers being Simpkin Marshall. In volume 5 Mr. Carrington had the assistance of Miss Flora Winstone. This series somewhat abruptly terminated when nearing the completion of the 8th volume (1902-3), eleven parts only being published.

There are very many writers who have made a name in natural science, who made their first contributions in the pages of *Science Gossip*.

A Classified Index to 'Science Gossip.' Vols. I.-XII., 1865-1876, was published.

Research.

In July, 1888, appeared vol. I., part 1 of this quarto publication, averaging 32 pages with covers, etc., printed in two columns.

* This was fully dealt with in *The Naturalist*, March, 1912, pp. 66-68.

Vol. I. ends at page 236. Vol. II., with a change of cover, commenced on July 1st, 1889, ended with No. 24, dated June 2nd, 1890, and contained 288 pages. With the completion of the second volume the journal ceased to appear on account of insufficient financial support. It contains a number of useful papers bearing upon natural history matters in the north of England, the work of the Yorkshire Naturalists' Union being frequently referred to.

The Wesley Naturalist.

In March, 1887, appeared Part 1 of 'The Wesley Naturalist,' an octavo publication of 32 pages (sold at 6d.), and the first number contains notes from the Rev. Hilderic Friend and other of our contributors. The journal was published by B. Moore, of Burnley. Each part contained a lithographic frontispiece, one being the famous Carboniferous Tree from Yorkshire, now in the Manchester Museum. The Wesley Naturalists' Society was responsible for much of the matter in its pages. Volume I. concluded with the number for February, 1888, the last page being 383.

Volume II., March, 1888 to February, 1889, 384 pages, and Volume III., March, 1889 to October, 1889* (232 pages) when the publication ceased.†

The editors were Revs. W. H. Dallinger, W. Spiers and Hilderic Friend.

The Natural History Teacher.

'A monthly illustrated magazine for Young Lovers of Nature, conducted by S. L. Mosley, a small 4to publication, was started in January, 1885, and Volume I. including the twelve parts for the year, contained 84 pages. Volume II. (parts 13-24, 1886) contained 92 pages, and we learn from the December issue that it had 'not circulated largely in the channel set out for it,' so it was decided to alter its character, and in its place appeared—

The Economic Naturalist.

'An illustrated monthly journal of useful natural history.' The first part (8 pages 8vo), was issued in January, 1887. I cannot ascertain how long it lasted, but I have seen Part 11, for November, 1887 (pages 91-98). The parts were sold at 2d. each.

The Naturalists' Guide.

A Journal with the above title evidently started somewhere about November, 1890, and apparently took the place of 'The Economic Naturalist.' I have only been able to see Parts 39-48, January to October, 1894. It was also edited, printed and

* Nothing was issued for September this year.

† I am informed by one of the editors that the *Wesley Naturalist* was then 'amalgamated with the Journal of the Postal Microscopical Society.'

published by Mr. S. L. Mosley (8vo. 10d. each). There were not many pages in each part,* but there were some really very fine plates of Butterflies, etc. The parts I have seen contain a note to the effect that 'the present volume will contain a complete monograph of British Butterflies and Sphinges, illustrated with coloured figures of every species.' Probably about the date named *The Naturalists' Guide* ceased, as we find Mr. Mosley's name as joint editor, for the first time, of *The Naturalists' Journal* for November, 1894, at the close of its third volume.†

The Naturalists' Record.

'The Naturalists' Record: a Monthly Illustrated Magazine, devoted to the interests of Science,' was conducted by H. C. Oakshott, of Falmouth, and was published by E. T. Oliver, London, price 2d. It contained 16 pages, all but the first in double columns, and the pages measured 10 by 10½ inches. Vol I., Nos. 1-9 (1889-90) were published.

The Country-Side.

'The Country-Side' is a journal of many vicissitudes. It first appeared as a weekly in May, 1905, and existed as such until vol. 10, which was unfinished, in 1909. It was 4to in size, averaged about 16 pages, was first sold at 1d. and then at 2d., and was edited by E. Kay Robinson. Its contributions consisted of natural and pseudo-natural history notes and articles written in a popular style, and very general in character. Some of them, however, refer to Yorkshire. The last part I have been able to trace is No. 244 of vol. 10, dated January 15th, 1910.

Then follows an extraordinary series of varied publications, most of which seem to have been associated in some way or other with the said E. K. Robinson.

In April, 1908, appeared vol. I., No. 1 of 'Country Queries and Notes.' By March, 1909, vol. I., No. 12 appeared with a total of 582 pages, in two columns, which completed vol. 1., as there is a title-page and index. It was published monthly at 4d.

In April, 1909, appeared vol. II., No. 13, of the same journal, paged 1-36, but by May the title is altered to that of—

Science Gossip and Country Queries and Notes.‡

and presumably to prevent confusion it is numbered vol. II, No. 2 and No. 14, and contains pages 37-96. By February, 1910. appeared vol. II., No. 11 and 23, pages 473-516 which closed the volume, and an index and title page were issued later.

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* One hundred and forty-four plates in the ten parts.

† See page 121 of the November issue, 1894.

‡ This should not be confused with the publication issued by Hardwicke, etc., referred to elsewhere.

In June, 1910, appeared vol. I., No. 1, of—

THE COUNTRY-SIDE MONTHLY.

royal 8vo, 42 pages in two columns, price 4d. From a reference on page 4 it seems clear that 'Country Queries and Notes' had suddenly expired and that no index was published. All seemed to go well with the first four parts of the new series, and then with vol. I., No. 5, which was issued for two months, namely, October and November, 1910, there is added to the title 'with which is incorporated Science Gossip and County Queries and Notes.' Vol. I., apparently concluded with the December number, No. 6, the last page being 258. By January, 1911, vol. II., No. 1, appeared, the volume being concluded with No. 6, for June, the last page being 240. Vol. III., contained the parts July-December, 1911, 210 pages. Hitherto we see that six parts constituted a volume. Vol. IV., part 1, contains an apology from the editor for the absence of any issue during December, and No. 1, 28 pages, is for January and February, and contains the title and index, (4 pages), to vol. III. All went well until No. 5, for June, which ended with page 156. There was no No. 6, but by July the title was again altered to—

THE COUNTRY-SIDE

and was marked 'New Series,' but was numbered vol. IV., No. 7, the paging starting with 157. It was continued until December, 1912, the last page being 536. There was no index nor title. This volume contains 11 parts issued during 1912.

During 1913, twelve monthly parts were issued forming vol. V., but again there is neither title nor index. During 1914 the publication again ceased, as we find in the press for February, 1915,

'THE COUNTRY-SIDE LEAFLET

has been established to fill the gap caused by the suspension of *Country Side* during the war.'

(*To be continued*).

——: o :——

We have received the **Transactions and Journal of Proceedings, 1913-14,** third series, volume two, of the **Dumfriesshire and Galloway Natural History and Antiquarian Society,** royal 8vo, 298 pages. Among many interesting papers we note: 'White Quartz Pebbles and their Archaeological Significance,' by Nona Lebour; 'A List of the Coleoptera of the Solway District,' by B. M'Gowan; 'Dumfries: Its Burghal Origin,' by G. Neilson, and 'Further Excavations at the King's Castle, Kirkcudbright,' by J. Robison. The following statement by Miss Lebour was a little unexpected: 'It is a curious fact, as Mr. Gatty pointed out to me, that the white quartz pebbles give out a bright spark when struck together, and even when struck under water the light emitted is almost better.' We certainly doubted this, but the statement proved to be true when put to the test.

MOSSES.

Dicranum strictum* Schleich.—On December 12th last, I found a small patch of this elegant and rare moss on a fallen tree in Sunnydale, E. Morton, near Bingley. I understand from Mr. W. Ingham, to whom I am indebted for the verification of my specimen, that this is an addition to the Yorkshire flora. —Harold E. Johnson, Bradford.

***Catoscopium nigritum* Brid., in W. Yorks.**—On Saturday, January 30th, Mr. W. H. Burrell, F.L.S., and I were examining the small exposure of Silurian rocks near Gordale Beck on Malham Moor, and were pleased to see a tuft of the above moss in fine fruit. The place is an interesting one for *Orthothecium rufescens* (*Stereodon*) and *Splachnum ampullaceum* are found here. The only other known Yorkshire habitat for *Catoscopium* is in Teesdale, an interesting fact being that a flowering plant, the alpine bartsia, has the same restricted range, growing near the moss in both places. The moss was once erroneously reported for West Yorkshire, but the above is the first record.—C. A. Cheetham.

***Dicranum strictum* in Yorkshire.** *Dicranum strictum* (*D. viride* of Braithwaite's Moss Flora) is one of the few mosses which, as an indiginous species, has been questioned. It was first found in Staffordshire in 1864 on old wooden rails, and it has been suggested that possibly it had been introduced with the timber. It has since been detected in other parts of the county and also in Banffshire and near Edinborough, and now shows four vice-county numbers, as its range in the Moss census lists. Whilst on what might be termed a preliminary visit to Sawley, where the Union meet on their first excursion this year, in company with Messrs. Margerison and Sanderson, I had the pleasure of gathering a small tuft of this moss. I submitted it to Mr. H. N. Dixon, who kindly confirmed the identification. The Sawley High Moor, where it occurs, was planted about 1860, and there is a possibility of the moss having been brought with the young plants, if so, it has evidently found the place suitable, existing there some fifty odd years. Another very rare moss, *Buxbaumia aphylla* was reported from this district and a note on it and at the same time a remark as to it being never since confirmed, will be found in both the West and North Riding floras. It is quite possible that *B. aphylla* might also be introduced with the trees, and if so it may still be refound there. If there is any fact in this theory for the introduction of mosses, is it not possible that there may be some surprises in store for other sections of the Union ; the wood in question is of very large extent, and has many interesting features for the general body of naturalists.—C. A. Cheetham.

* It is remarkable that there should be two records of this rare moss within a fortnight.—Ed.

NEWS FROM THE MAGAZINES.

In *British Birds* for January, Mr. H. C. Alexander writes 'A Practical Study of Bird Œcology.'

In *The Museums Journal* for December, Mr. B. H. Mullen describes the Children's Room at the Salford Museum.

In volume 4, part 1, of the *Journal of Roman Studies* is an article on 'Roman Silver in Northumberland,' by Professor Haverfield.

The Museums Journal for January contains a paper on 'Bankfield [Halifax] Museum Publications,' by Mr. H. Ling Roth.

Volume 15, part 1 of the *Annals of the South Arican Museum* consists of an account of 'South African Crustacea,' by the Rev. T. R. Stebbings.

The Irish Naturalist for February is partly occupied by 'A List of the Land and Freshwater Mollusca of the Dingle Promontory," by A. W. Stelfox.

In *The Zoologist* for January, Colonel C. E. Shepherd gives an illustrated note on 'The Location of the Sacculus and its contained Otoliths in Fishes.'

In *The Quarry* for February, Mr. R. Parker has an article on 'Tar Macadam, its Manufacture and Industry,' in which he describes the works of Messrs. Ord and Maddison of Darlington.

With *The Zoologist* for January, the editorship has changed. Mr. W. L. Distant has severed his connection with the journal after many years' work, and the new editor is Mr. Frank Finn.

Bird Notes and News volume 6, part 4, contains an interesting article on the food of the house sparrow, and the statistics are certainly in favour of the bird being of service to the fruit grower.

In *The New Phytologist,* volume 13, No. 9, we notice an article by N. Bancroft on 'A Review of Literature concerning the Evolution of Monocotyledons,' and in part 10 of the same journal there is a paper by Ruth Holden on 'The Relation between Cycadites and Pseudocycas.'

In the *Scottish Naturalist* for January, Mr. W. Eagle Clark describes 'A New Scottish Bird: the Aquatic Warbler, at Fair Isle,' and in the same Journal, Mr. George Bolam has notes on 'Newts on the Eastern Borders,' in which reference is made to localities in Northumberland.

British Birds for February contains an illustrated paper on 'Breeding Habits of the Little Stint,' by Maud D. Haviland. Mr. H. W. Robinson gives a report on the results of Ringing Black-Headed Gulls. From the list it seems that of 8,096 birds ringed at Ravensglass, 345 have been recovered.

In *The Geological Magazine* for January is a notice of the work of Dr. Arthur Smith Woodward, of the British Museum (Natural History), whose researches among the fossil fishes, etc. are so well known. Dr. Woodward has done much to add to our knowledge of the fossil fishes of the Yorkshire Lias, etc. The memoir is one of the 'Eminent Living Geologists' series, and is accompanied by an excellent portrait.

Among many of the articles appearing in *The Essex Naturalist,* parts 10 and 12 of volume 17, for April-December, 1913, recently received, we notice:—'Sarsen, Basalt, and other Boulders in Essex'; 'The Coast-Flora of the Clacton District'; 'Mycetozoa seen during the Cryptogamic Forays in Epping Forest'; 'The Occurrence of Rhaxella-Chert in Epping Forest Gravels'; 'Notes on Essex Geology at the latter end of the Nineteenth Century and After'; 'Cultivation of Fuller's Teasel in Essex,' etc.

Some Geographical Factors in the Great War.

By T. HERDMAN, M.Sc., F.G.S.

(Lecturer in Geography, Municipal Training College, Hull).

72 pages, crown 8vo, with 6 Maps, sewn in stout printed cover, 9d. net, post free 10d. net.

A feature of vast importance in the titanic struggle now taking place is the geographical condition of the various countries. In "Some Geographical Factors" the author provides much interesting information which helps his readers to a wider understanding of an important aspect of the present campaign. The concluding chapter on "The Problems of Nationality" affords a glimpse of the immense difficulties that face those statesmen to whose heads and hands will be committed the adjustment of the new boundaries.

The "Literary World" says:—"Those who would follow intelligently the movements in this world contest will find much help in this little handbook. Mr. Herdman's exposition of the part played in the war by the great land-gates and the seas is clear and informing, and is followed by some sound reasoning on the commercial war and the problems of nationality."

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THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, F.G.S., F.R.G.S., F.S.A.Scot.,
THE MUSEUMS, HULL;
AND
T. W. WOODHEAD, Ph.D., F.L.S.,
TECHNICAL COLLEGE, HUDDERSFIELD.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, F.R.S. F.L.S., GEO. T. PORRITT, F.L.S., F.E.S.
Prof. P. F. KENDALL, M.Sc., F.G.S., JOHN W. TAYLOR,
T. H. NELSON, M.B.O.U., RILEY FORTUNE, F.Z.S.

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THE BRITISH ASSOCIATION.

The Council of the British Association, in consultation with the local Executive Committee at Manchester, have decided that the annual meeting of the Association shall take place in that city as arranged, in September next. Both the Committee and the Council felt that it would be inexpedient under the present conditions to offer that elaborate local hospitality in the form of social and other arrangements which has been extended to the Association on former occasions. The Committee, however, desire that the long continuity of yearly meetings should not be broken, and would prefer that the meeting should be held, although restricted to its more scientific functions.

PHENOLOGICAL OBSERVATIONS.

We have recently received from Messrs. J. E. Clark and R. H. Hooker a copy of a very valuable report of Phenological Observations. It includes most useful information with regard to dates of flowering of plants, the dates of song and migration of birds, the first appearance of insects, etc., all very carefully classified and commented upon. Mr. Clark informs us that he has been fortunate in securing the co-operation of thirteen observers in the West Riding, but at present there is only one each for the North and East Ridings. We feel sure there are many naturalists who would be willing to assist him. The work is not difficult. Possibly any who may feel disposed will communicate with Mr. Clark, ' Asgarth,' Riddesdown Road, Purley, Surrey.

RECORDS OF NEW BRITISH BIRDS.

We notice that the editor of *British Birds* in his publication for March, thanks us for disposing of a bad record in connection with the alleged black-headed bunting in Yorkshire. It will be remembered that at a meeting of the British Ornithologists' Club, two examples of this continental species were recorded, both had been bought from dealers, and both are now in a Sussex Museum. We must admit that we quite expected Mr. Witherby would delete the Yorkshire specimen from his list, but he says nothing about the Sussex specimen, so that presumably it stands ! He cannot see the force of our contention, that, having fairly proved that in this instance the record was wrong, there is ' quite a suspicion, and, in fact, more than suspicion, as to the bona fides of other recent records of British Birds " seen in the flesh." ' At any rate, Yorkshire naturalists are glad to be rid of their alleged new record, and are quite prepared to leave their friends in Sussex to have as many ' new records ' as they like.

THE LATE PROFESSOR JAMES GEIKIE, F.R.S.

We regret to record the death at Edinburgh, late on March 1st, of Dr. James Geikie, F.R.S., younger brother of Sir Archibald Geikie, and, like him, a distinguished geologist. James

Geikie was born at Edinburgh in 1839. In 1861 he joined the Geological Survey of Scotland. For twenty-one years he was engaged on this survey, and rose to be District Surveyor, and Local Director of the Survey in Scotland. On the retirement of his brother, Sir Archibald, from the Murchison Professorship of Geology and Mineralogy in Edinburgh University, in 1882, James Geikie was appointed his successor, and that same year, on the institution by the Royal Commission of a Faculty of Science in the University, he was at once elected Dean of the Faculty.

JAMES GEIKIE'S BOOKS;

He was the author of several books that enjoyed considerable popularity with students; notably, 'The Great Ice Age in its relation to the Antiquity of Man,' which was first published in 1874, and reached its third edition in 1894; 'Prehistoric Europe—a Geological Sketch,' 1882; 'An Outline of Geology,' 1884; fourth edition, 1903; 'Fragments of Earth Lore,' 1893; 'Earth Sculpture, or the Origin of Surface Features,' 1898, reissued 1909. In a different vein from his scientific work was a book on 'The Songs and Lyrics of Heine and other German Poets,' published in 1887. His latest books were, 'Structural and Field Geology,' first published 1898, and again issued in a third edition in 1912; 'Mountains, their Origin, Growth, and Decay,' published in 1913, and 'The Antiquity of Man in Europe,' 1914.

HIS HONOURS.

Professor Geikie was one of the founders and an original member of the Royal Scottish Geographical Society, and the honorary editor of the 'Scottish Geographical Magazine'—the organ of the Society. He was awarded the Macdougall-Brisbane Medal of the Royal Society of Edinburgh, the Murchison Medal of the Geological Society in 1889, and the gold medal of the latter Society in 1910. He was also an honorary and corresponding member of many foreign scientific societies. From Edinburgh University he received an honorary LL.D. and D.C.L., and he was a Fellow of the Royal Society, and of the Royal Society of Edinburgh.

THE TAMING OF STREAMS

Mr. G. W. Lamplugh, F.G.S., has favoured us with a copy of his paper in *The Geographical Journal* on 'The Taming of Streams.' In this he says, 'In uninhabited regions the rivers are wayward and restless, ever shifting from place to place within the bounds of the valleys, that are theirs to sprawl across at will. If a flood should heap up a bar in the channel; or fallen timber gather into a dam; or swamp-vegetation block the fairway in a sluggish reach; the stream swings easily aside into a fresh course. In a new country the tangled swampy bottom-lands of the valleys are the most difficult of all to

traverse. It was so with the valleys of Britain at the beginning of human occupancy, and this explains why the oldest roads of our country so often take an ill-graded way instead of the apparently simpler and more direct course along a valley.'

IN INHABITED COUNTRIES.

'But as soon as a country acquires a settled population, this unstable habit of running water is corrected. For many reasons, human interests demand that a stream shall have a fixed course. When tribal or individual ownership of land was established, the rivers and streams often afforded the best natural boundaries. The convenience of sites chosen for dwellings depended upon the constancy of the waters; and every cattle-enclosure required a permanent drinking place. Even the smallest brooks thus came under the influence of proprietary rights that were exerted to restrain the stream to the convenient channel and to curb its natural waywardness.'

BRONZE-AGE INVADERS OF BRITAIN.

Nature, No. 2363, contains the presidential address delivered to the Royal Anthropological Institute by Professor Arthur Keith, F.R.S., on 'The Bronze-Age Invaders of Britain.' He informs us 'that somewhere about the year 2000 B.C., when the peoples of western Europe were beginning to learn the uses of bronze and to alter the style of their pottery, a race of invaders began to reach our shores, who were totally different from any race which had lived in Britain before that time. The ancient British, although of various strains, were all of them of the long-headed type; they had projecting occiputs; their heads appeared as if compressed from side to side. But those Bronze-Age Invaders had rounded heads, with flat occiputs; their heads had the appearance of having been compressed from back to front. European anthropologists name this round-head type of man "Celtic"; they regard him as an offshoot from the racial type which now attains its greatest purity in the mountainous countries of Central Europe—the "Alpine" type of race.'

DIFFERENT LANDING PLACES.

'The Hon. John Abercromby, who is our leading authority on British pottery, weapons, and ornaments of the Bronze age, is of opinion that the round-headed invaders were few in number, and that, after gaining a foothold in Kent, they gradually spread northwards and westwards throughout our country. With that conception I cannot agree. The south-eastern part of England was apparently only one of the landing places; the reseaches which were carried out by Canon Canon Greenwell and Mr. Mortimer leave us in no doubt as to their arrival in eastern Yorkshire; the round-heads became masters of it. The counties which bound the Firth of Forth

formed another centre of the invasion; the round-heads conquered that part of Scotland. For our present purpose their extensive settlement in the lowlands of Aberdeenshire and along the southern shores of the Moray Firth are the most important. In recent years Prof. Reid and Dr. Alex. Low, of the University of Aberdeen, have made us familiar with the Bronze-age men of the north-east of Scotland. These more northern invaders had their own peculiar kind of round-headedness, a kind remarkably flat on the crown—just as they had their own kind of graves, their own kind of pottery and ornaments.'

NEWSPAPER ARCHÆOLOGY.

Excavations made in connection with home defence have exposed some skeletons in North Lincolnshire. According to the Press, 'the peaceful and picturesque park at Riby was the scene of a somewhat startling and gruesome character recently. While excavating, a beautifully preserved and compact skeleton of a finely developed man, well over six feet in height was unearthed. The teeth were so fastly embedded in the jaws that even now it is impossible to draw them out. Through the groin was a dagger about six inches in length. This however, was in a corroded condition that at the merest touch it crumbled away to powder. Quite close to these remains were found an ancient earthenware jar, possibly of an ancient type, which had been buried long before the skeletons, as the figuring upon the vessel, according to an authority suggests the period of the ancient Briton.' Some printed semi-parchment was another interesting find. 'Now what does the discovery of all these human remains suggest? We have it in history that there were battles in every part of Lincolnshire during the Civil War of the seventeenth century!' It seems that apparently part of an Anglo-Saxon cemetery was discovered. Possibly however, the parchment will tell us all about it.

CONE-IN-CONE STRUCTURE.

At a recent meeting of the London Geological Society, Mr. S. R. Haselhurst gave 'Some Observations on Cone-in-Cone Structure and their Relation to its Origin.' He outlined the phenomenon of megascopic pseudostromatism, and certain tectonic features which are always associated with cone-in-cone structure in areas where it is greatly developed. He pointed to the disadvantage accruing from many observers not having seen it *in situ* on a large scale, and endeavoured to show how a simulation of horizontality in stratification masks what he took to be the key to the diagnosis of this structure. Two typical areas are described:—(*a*) The St. Mary's Island-Tynemouth district of the D_5 Coal-Measures of Northumberland; (*b*) The Hawsker-Robin Hood's Bay-Ravenscar district of the North Riding of Yorkshire. The specimens collected in these areas

were said to be unique, and some dozen types from other areas, including Sandown, Portmadoc, Olney, Somerton, Lyme Regis, and Merivale Park were examined in detail with reference to :—(*a*) Evidence furnished by distorted fossils ; (*b*) Chemical composition ; (*c*) Geometrical similarities ; (*d*) Microscopic structures. The Author critically examined the accepted hypothesis that cone-in-cone structure is something essentially due to crystallization. He concluded from the evidence of experiments (i) that cone-in-cone is not due to crystallization, but is a mechanically produced structure due to great and localized pressure ; (ii) that it is closely allied to the phenomenon known as pressure solution ; (iii) that cone-in-cone structure is closely associated with other rock-structures which are mutually indicative the one of the other, and also of their mode of origin.

PROFESSOR BONNEY ON CONE-IN-CONE.

At the meeting a letter was read from Prof. Bonney, viz :—

' In the *Mineralogical Magazine*, vol. xi., p. 24, I published a paper discussing the origin of cone in cone structure, which was in general agreement with, but supplementary to, the work of Sorby, Mr. W. S. Gresley, and Prof. G. A. J. Cole. Though I had for some years been examining specimens which showed this structure, it was not until 1892 that I chanced to come across a good instance of it in the field. That occurred in the upper part of the Wealden formation at Sandown Bay, in the Isle of Wight. The lower portion of the specimen contains, in a rather muddy calcareous matrix, numerous more or less imperfect valves of lamellibranchs (? *Cyrena*), a few gastropods (probably *Paludina*), and numerous valves, double or single, of ostracods, together with a few subangular fragments of quartz. The upper portion is a homogeneous dirty limestone. In it the " shaving brush " crystalline structure is well developed. It is true that this bed forms part of the Isle of Wight anticline, but none of the organisms, and no part of the specimen, show the slightest sign of crushing *in situ*, or of any kind of disturbance from pressure. Evidence of that is tendered in the paper, and reasons are given for believing that the spiral cracking of the cone in cone is the result of contraction, probably in drying. Thus, to whatever inductions the Author's experiments and observations may lead, I am obliged to regard them as incompatible with all the specimens that I have examined and must continue to maintain, as stated in the concluding words of my paper, published in 1894, that cone in cone structure is primarily due to crystallization, but the development of it—" its existence in short as cone in cone—is due to contraction subsequent to this crystallization, and thus the mechanical cause is not less essential than the chemical for its formation." '

COAST EROSION.*

J. J. BURTON, F.G.S.

COAST erosion is not confined to Yorkshire nor to our British coasts.

All land areas are subject thereto. Inland surfaces are carried down the streams so that the sea is swallowing the hills and eating up the valleys. All ocean fringes are not equally eroded. Some very little, others considerably. Some are gaining.

Much attention has been given to this subject in recent years, but sea encroachment is as old as land formation, and man's fight against it as old as civilisation.

The coast of Holderness is probably the most seriously affected in this country, and the subject is therefore very appropriate for a Hull gathering of Geologists.

From investigations made by Professor Phillips 60 years ago, by our President, Mr. Sheppard, recently, and by a Royal Commission, we find that the Manor of Tharlesthorpe provided pasturage for 1,274 sheep in the thirteenth century and yielded annually 300 quarters of grain. The whole area disappeared in the fifteenth century. Ravenser once returned two members to Parliament and has an important place in history. Where it stood is to-day unknown.

Auburn, Hartburn, Hyde, Frismersk, Redmayr, Pennysmerk, Upsal, Pottersfleet, Owthorne, are now merely place names without a site. Withernsea and Dimlington are rapidly joining the group. In the North Riding, as well as in the East Riding, the sea is claiming for its greedy maw, chunks from Sandsend, Whitby, Robin Hood's Bay, Scarborough, and on to Filey. Further south along the Suffolk coast, in spite of protective works, the loss is considerable. In the Channel on the Hampshire coast the waste of cliff is enormous, and there is keen competition between it and Holderness for premier place in spending power.

We might take a tour with the tides in their ebb and flow round our coasts and observe the changes going on, but time limits confine me to a brief consideration of the causes which are producing the effects we see or could see.

As a general rule it is the older and better compacted rocks which offer the greater resistance, but this resistance varies inversely as the rocks are fissured, irregularly bedded, or dip shoreward, and is affected by many other conditions such as faults, permeability, solubility, springs, surface drainage, nature

* Paper read at the meeting of the Yorkshire Naturalists' Union (Geological Section) at Hull, November 7th, 1914. It was illustrated by several lantern slides.

of the beach, whether hard or soft or shelving, as well as by the set of currents and tides.

The atmosphere has great crumbling action on soft bedded rocks, and they would gradually accumulate as rock debris or talus, and be banked up against any cliff exposure and so protect it from further denudation, but in the case of shore cliffs this protective action is denied them, and waves carry away the weather-worn material, and thus atmospheric denudation is continuous.

A fault is in itself not necessarily an active agent in wasting shore cliffs, but faults usually produce springs of water and these are a most prolific source of waste of land.

Rocks of hard material which will withstand great abraisive action, are sometimes composed of such porous or soluble matter that percolating rain water dissolves some of their constituents and gives them a brecciated appearance, and makes them peculiarly liable to marine denudation. Magnesian Limestone and Chalk, and even the more resisting Mountain Limestone, come under this head.

Currents have much to do with erosion, as unless the wasted rock material is removed the waste would cease. How some currents are formed is not quite easy to explain, but their effects are visible in such places as Spurn Point, Chesil Bank, Dungeness and elsewhere where the travel of beach material has been arrested. This travel is curious. Apparently it is from north to south between the Tweed and Thames; west to east along the south coast up to the Thames; south to north along the west coast as far north as Morecambe Bay; then locally, north to south between Walney Island and Workington; from there again north round the coast of Scotland back to the Tweed.

Rain water, whether by carrying down the soft surface deposits, or by percolating through the hard subsoil and the still harder lower rocks, greatly aids erosion. In the former case the action is direct and evident. In the latter it is indirect and inferential, but not less certain. The solvent action of the water removes certain salts from practically every rock through which it percolates, and in the case of Magnesian and Carboniferous Limestones and Chalk this action is fairly rapid. Under certain conditions the same solvent force is equally active in ferruginous rocks. Surface drainage by cutting down the land surface until it reaches sea level is another continuous cause of coast erosion.

A laminated and jointed shale beach is peculiarly liable to be broken up, and as the breaking up process proceeds the waves reach further inshore with greater force. The converse is true.

Erosion is greatest around our shores (*a*) where the shore cliffs consist of masses of boulder clay, sand and gravel, or

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other drift material, as in the estuary of the Humber and Holderness, and in many of our filled up ancient valleys which now form Bays in our coast line; or (*b*) in the great Eocene basin on the south coast, especially amongst the Bagshot sands, gravels and clays of the Hampshire area.

Vegetable growths, such as Marram grass on the sand dunes, by knitting the sand together by root fibres, arrest waste by wind and wave; and so also seaweed growing on a rocky shore, by offering a soft cushion to the sand and pebbles, and lumps of rock thrown on it by the stormy sea, saves its host from being worn away by attrition.

On the other hand it sometimes contributes to destruction when growing near or below low water level, as big billows tear it up along with some of the rock in which it has clung. Stormy seas carrying grit, pebbles or chunks of rock, break down by attrition, but it is in their lifting and carrying power that their influence is greatest.

It is a true saying that the lowly and minute are important, but who would imagine that the rock boring mollusc *Pholas* had anything to do with coast erosion, and yet it is proved that by their boring they have lowered the sea shore chalk beds in the neighbourhood of Cromer until they are now below sea level.

The little limpet on the other hand protects the rocks to which it clings from abrasion and attrition.

A last instance. Hard rocks by earth movements become broken up, fissured, faulted, or bent and weakened. In such condition they are an easy prey to a stormy sea.

Is England disappearing? No. Some parts are losing heavily, which is a pity. Others are gaining considerably, which is pleasing, but the gainer does not compensate the loser, and it is too often fertile land which goes and sterile land which is made.

Protective works are of doubtful value. They often change the direction of currents and arrest the travel of beach material, and cause a gain in one locality at the expense of erosion in another.

Reclamation works on the other hand have added many valuable areas won from the waters.

Doubtless the whole land area is being lowered, but the process, counted by lives, is too slow to be important, and before it becomes so, earth movement may have counteracted or accelerated it. We have no data for a forecast of events.

In the meantime land is being lost here and gained there. There is everywhere change, but in the balance there is no loss.

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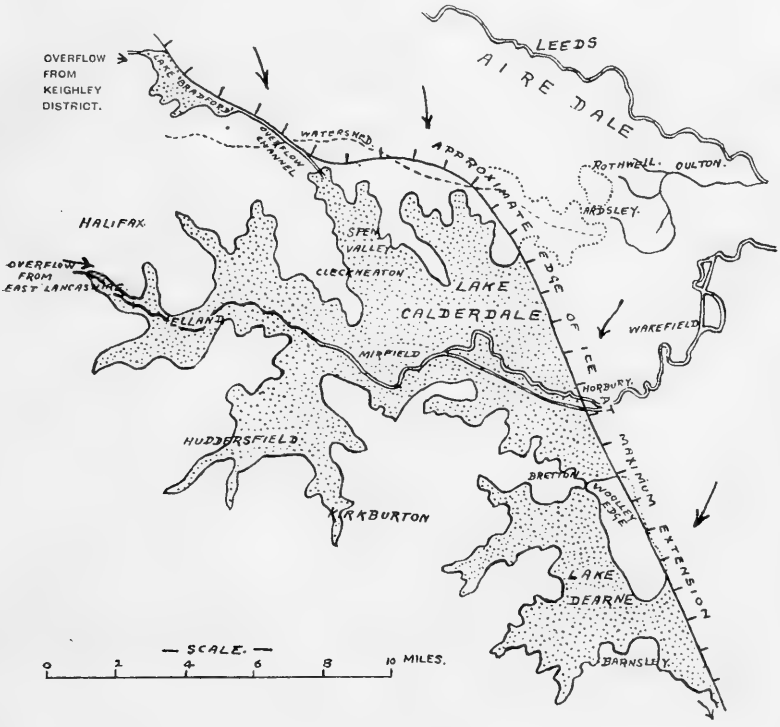
Mr. Henry Coates has been appointed Curator of the Perthshire Museum in place of the late A. M. Roger.

A NEW RECORD OF GLACIAL DRIFT NEAR WAKEFIELD:

AND ITS BEARING ON THE LATE GLACIAL CHANGES IN LOWER CALDERDALE.

D. A. WRAY, B.Sc., F.G.S.,
H.M. Geological Survey.

SOME months ago my attention was drawn to some excavations being made to the immediate west of the church in the centre



of the village of Horbury, near Wakefield. Under two feet of made ground the subsoil consisted of about four to six feet of clayey gravel, resting on much disturbed Coal-measure shales. As both slopes of the Calder valley appear to be very free from glacial drift, this deposit is worthy of note, and especially the peculiar type of boulders it contains. These consisting in the main of Carboniferous sandstones and grits, which might have come from any direction; also include several brown and black flints; fossiliferous Magnesian limestone; red quartzite

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(Bunter ?) ; Shap granite, with characteristic large felspar crystals ; and a small pebble of decomposed basalt, the origin of which I have been unable to ascertain.

The exact extent of the deposit could not be estimated, as all the adjoining ground is built over, but it seems to be quite small as the workmen informed me they had not seen any similar deposit in making excavations close at hand. Moreover, the material dug in the churchyard close by, is typical yellow Coal-measure clays and shales. It seems probable therefore, that this small patch may have escaped erosion by being preserved in a pre-glacial hollow. The gravel was but little waterworn, though the larger boulders, four to five inches across, are well rounded, while some seem to show glacial striations. The locality is about 250 feet above sea-level or about 160 feet above the level of the river Calder at Horbury.

The general bearing of this deposit on the glacial history of Lower Calderdale seems to be of considerable interest. The researches of Professor Kendall and others have shown* that in late glacial times all the Pennine valleys as far south as the Aire had their own glaciers, which descended on to the vale of York. The Calder valley however, does not appear to have been occupied by any glacier of its own, but instead, to have been filled with the meltwaters of the extensive ice-sheets on the Pennines of East Lancashire. This suggestion is strongly supported by the character of the deposits on the floor of Calderdale, and the general contour of the valley ; while the researches of Dr. Jowett further indicate that the conspicuous gorge which truncates the Pennine watershed at Walsden is in reality a 'col' produced by the overflow of an extensive series of glacial lakes in East Lancashire.† East of Todmorden no true boulder-clay has been recorded in Calderdale, and the bed of the river is composed of a sandy clay with numerous rounded stones, which in the neighbourhood of Mirfield reaches a thickness of 30 feet,‡ and at Dewsbury about 50 feet.

An undoubted eastern element, however, first makes its appearance at Horbury, where in addition to the small outlier of drift described above, Professor Fearnsides has recorded a similar set of erratics from the valley floor ; including in addition the distinctive 'rhomb-porphyry'§ which is not known in situ nearer than Scandinavia.‖

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*P. F. Kendall.—Victoria County History, Yorkshire (Geology). Lond., 1907, pp. 79-90.

† A. Jowett, Quart. Journ. Geol. Socy. vol. 70, 1914, p. 215.

‡ P. F. Kendall, op. cit. p. 88.

§ There is a possibility that this is a comparatively recent introduction.—Ed.

‖ W. G. Fearnsides, Brit. Assoc. Rep., 1901, p. 286.

These records, therefore, seem to indicate that an ice-sheet from an easterly source pushed up the valley as far as this point. On the other hand it might be suggested that as no true boulder-clay has been found here, these erratics reached their present position by means of icebergs, but this seems very improbable when it is seen later that the whole current of water would be in an opposite and easterly direction.

The conditions in Airedale have been described by Messrs. Jowett and Muff, who state that 'at the period of maximum glaciation, there stretched along the southern border of the Airedale glacier, a series of six lakes, the surface levels of which fell from about 1,325 feet in the north-west to about 700 feet in the Bradford basin. The overflowing waters from these lakes discharged into the head of the Spen valley, and so into Calderdale.'*

The quantity of water entering Calderdale at this period must therefore have been very considerable, including, as it did, probably the whole of the meltwaters from the southern edge of the Airedale glacier, and also that from the extensive series of glacier-lakes described by Dr. Jowett in East Lancashire. Though this water may have at first entered a glacial 'Lake Humber' in the vale of York,† it must have been subsequently diverted by the presence of the ice, which is indicated by the scattered patches of boulder-clay around Barnsley and Doncaster. These deposits have been described by Mr. W. L. Carter, and according to him indicate that the ice at its maximum extension reached as far east as the valley of the Dearne, and closed the present outlet of the Calder.‡ He further adds that 'we cannot stop the movement short of Woolley Edge ridge, on the eastern slope of which, up to 250 feet, are several drift gravel-patches. A great lake would necessarily be formed in Calderdale, fed by the overflow from the Lancashire side by way of the Burnley and Summit valleys. This lake would gradually creep up to Mirfield, accounting for the great deposits of drift at 150 feet above O.D., with abundance of great angular blocks of ganister, and to Elland, where there are extensive detrital deposits in the valley, and up to Mytholmroyd, where it would account for the great delta from 330 to 360 feet above O.D." § The bottom of the overflow channel between Woolley and Bretton is 405 feet O.D., so that a very considerable glacial lake must have existed (cf. accompanying plan). The waters from this lake would be discharged at this period 'into Lake Don by way of which they would pass by the Kiveton gorge

* A. Jowett and H. B. Muff, Proc. Yorks. Geol. Socy., vol. XV., 1905, p. 228.

† P. F. Kendall, Quart. Journ. Geol. Socy., vol. 58, 1902, p. 567.

‡ L. W. Carter, Proc. Yorks. Geol. Socy., vol XV., 1905, p. 434.

§ Ibid. pp. 434 to 435.

into the Triassic plain which was then probably also a glacial lake.'*

Mr. Carter, however, further contends that the existence of this lake would explain the deltaic sands and gravels which occur on the Aire-Calder watershed at Rothwell and Oulton. These, however occur much farther east than Horbury, and moreover at an altitude varying from 175 to 275 feet O.D., so that it seems more probable they would be produced during a later stage, when the ice had retreated down the Calder valley. That they were produced by the washing and sorting of the lateral moraine of the Airedale glacier, as Mr. Carter suggested, seems highly probable from more recent observations† made there, and it seems highly suggestive they were probably produced when glacial lake Calderdale had much contracted, and was probably overflowing by a lower 'col' on the Calder-Dearne or possibly on the Calder-Went watersheds.

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Among the additions to the *Spalding* Museum in the Report recently printed, we notice that Mr. Reeks has given a 'Phlegm.' We now know why certain objectionable notices are posted up in some museums.

The *Warrington Museum and Library* has issued its 'Recent Additions to Books and Specimens,' dated December, 1914, 12 pages, which is sold at one half-penny. In the list we notice 'Ichneumon-Flies, British, 328 species,' which seems a good haul.

The seventh report of the Public Library, Art Gallery, and Museum, *Beverley*, contains a list of additions for the year. We notice that the Water Vole and Pole Cat are classified under 'Birds, etc.' whereas Hedgehogs come under 'Miscellaneous.' In eggs we have the following entries: 'Guillemot, Ostrich, Swan's eggs, Turkey eggs.'

From the National Museum of Science and Art, Dublin, we have received six parts of the *Museum Bulletin*. It is a well illustrated and well written magazine, and contains particulars of some of the important acquisitions, etc., during the year. It deals with with a variety of subjects, such as snails, lace, old glass, Roman portraits, porcelain, medals, plants, furniture, statuary, etc. The publication is one of the best that we know issued by a museum.

In the last report of the *Public Museum, Sheffield*, the 'list of additions in the previous two years shows continued liberal donations from the public, and steady development of the collections by purchase.' Nearly 1,000 specimens have been added, viz.: 'Zoology 265; Geology and Mineralogy 235; Coins, Archaeology 72; Pottery, Art, Medals 290; Cutlery, Metal Work 97. The publications received from the British Museum are particularly useful in connection with the scientific work of the museum.'

The Hull Museum has recently issued its *Quarterly Record of Additions No.* 49; illustrated; (publication No. 102). It contains reproductions of old views of east Yorkshire, New Yorkshire tokens, and a Saxon bronze pendant, old Yorkshire lead work, a mortar, etc. Publication No. 105 has also appeared and contains a well illustrated account of East Yorkshire Antiquities, and Excavations at Scarborough, by the Curator. Both these papers are reprinted from the Transactions of the East Riding Antiquarian Society.

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* Ibid. p. 435.

† E. Hawkesworth, Proc. Yorks. Geol. Socy., vol. XV., 1905, pp. 456-462; and Trans. Leeds Geol. Assoc., part XVI., pp. 24-26 and 31, 1911.

NEW RECORDS AND ADDITIONAL LOCALITIES FOR THE MOSS-FLORA OF YORKSHIRE AND DURHAM.

RICHARD BARNES.

(*Continued from page 94*).

Mnium orthorrhynchum B. & S. Bolton Woods (64), Thorns Gill, Ribblehead (64), and at West Burton, Wensleydale (65).

Mnium subglobosum B. & S. Sawley Moor, Ripon (64).

Neckera pumila Hedw. On tree below Giggleswick Scars, near Settle (64).

Thuidium hystricosum Mitt. By road side, Nosterfield (65).

Pylaisia polyantha (Hedw.) B. & S. Copgrove (64); and Langdon Beck, Upper Teesdale (66).

Eurhynchium Teesdalei Schp. Ling Gill, Ribblehead (64).

Plagiothecium latebricola (Wils.), B. & S. Ripley (64), Banks of the Nidd near Scotton Dam (64), Lul Beck, Ramsgill (64), Bardsey (64).

Amblystegium Sprucei B. & S. On rocks near the Dropping Well, Knaresborough (64), Thorns Gill, Ribblehead (64).

Amblystegium confervoides (Brid.), B. & S. Below Giggleswick Scars (64), on stones.

Amblystegium varium (Hedw.) Lindb. Newsham, near Thirsk (62), with fruit.

Amblystegium irriguum (Hook and Wils.) B. & S. Cotherstone near Barnard Castle (65), Baydale Beck and Cleasby, near Darlington (66), Bolton, in rivulet near the Wharfe (64).

**Amblystegium irriguum* (Hook & Wils.) B. & S., var. *spinifolium* Schp. Marske Mill, Saltburn (*62). A new County record.

Hypnum incurvatum. Deep Gill, East Witton (65), and by the Yore above Wensley Bridge (65).

Hypnum ochraceum Turn. On stone in the Nidd, Birstwith (64).

Hepaticæ.

Blasia pusilla L. Blayshaw Gill (64). In very fine condition.

Alicularia Geoscyphus DeNot. Guisbrough Moor (62).

**Aplozia lanceolata* (Schrad.) Dum. var. *prolifera* Breidler. In woods between Kirby Knowle and Cowesby, near Thirsk (62).

I have submitted specimens of this gathering to Mr. Symers M. Macvicar and he kindly informs me not only of its correctness, but that it is new to Britain.

**Lophozia Muelleri* (Nees.) Dum. var. *Libertæ* (Hüben)

Schiffn. Middlesmoor, Upper Nidderdale (64). New to the County.

Lophozia bicrenata (Schmid.) Dum. Boltby, near Thirsk (62), with perianths.

Lophozia excisa (Dicks.) Dum. Guy's Cliff, Pateley Bridge (64).

Lophozia barbata (Schmid.) Dum. Ling Gill, Ribblehead (64).

Sphenolobus minutus (Crantz.) Steph. Guy's Cliff, Pateley Bridge (64). Ll. J. Cocks, 1897; Ll. J. C. and R. B., November, 1914. Ling Gill, Ribblehead (64).

Plagiochila spinulosa (Dicks.) Dum. Ling Gill, Ribblehead (64).

Pedinophyllum interruptum (Nees.) Pears. Ling Gill, Ribblehead (64), with antheridia. Thorns Gill, Ribblehead (64), with perianths. West Burton, Wensleydale (65).

Pedinophyllum interruptum (Nees.) Pears. var. *pyrenaicum* Spruce. Howstean Beck (64), with fruit June 1911.

Cephalozia connivens (Dicks.) Lindb. On Harlow and Sandwith Moors, Harrogate (64), and Sawley Moor, Ripon (64).

**Cephalozia macrostachya* Kaal. Sandwith Moor near Beckwithshaw. This is not mentioned in the last census for V.C. 64, and is I believe a new record for it, if not for the county generally.

Cephalozia Francisci (Hook.) Dum. Harlow Moor, Harrogate (*64). New to V.C. 64.

Cephalozia fluitans (Nees.) Spruce. Sawley and Sandwith Moors (*64). New to V.C. 64.

Nowellia curvifolia (Dicks.) Mitt. Duncombe Park, Helmsley (62).

Odontoschisma denudatum (Nees.) Dum. Widdy Bank, Teesdale (*66), Sandwith Moor (*64). New to V.C. 64 and 66.

Lepidozia Pearsoni Spruce. Thorns Gill, Ribblehead (*64). New to V.C. 64.

Scapania compacta (Roth.) Dum. Ravensgill, Pateley Bridge (64), with perianths.

Scapania subalpina (Nees.) Dum. Thorns Gill, Ribblehead (*64). New to V.C. 64.

Scapania Bartlingii (Hampe.) Nees. Richmond (65), Aysgarth Force (65), Thorns Gill, Ribblehead (64).

Scapania aspera Bernet. On walls near Ribblehead, and between Hawes Junction and Thwaite Bridge (65), also very fine in similar places in going from Settle to Scaleber Force (64).

Scapania intermedia (Husnot.) Pears. Duncombe Park, Helmsley (62).

Scapania rosacea (Corda).) Dum. Brimham Rocks, Nidderdale (*64), Widdy Bank, Teesdale (*66). New to V.C. 64 and 66.

YORKSHIRE'S CONTRIBUTION TO SCIENCE.

(Presidential Address to the Yorkshire Naturalists' Union, delivered at the University, Leeds, 5th December, 1914.).

By T. Sheppard, F.G.S.

(*Continued from page* 114).

EXISTING MAGAZINES AND THEIR PREDECESSORS.

The Naturalist.

The first magazine bearing this title was evidently a written monthly periodical, issued at York. For the following reference to it I am indebted to Mr. E. G. Bayford; it is taken from 'John Stephenson Rowntree: His Life and Work.' Memoir by Mr. Rowntree on the 'History of the York Friends' Boys' School,' 1908, page 339:—

'Lovell Squire came to Laurence Street as a teacher in the summer of 1829. Amongst other ways of interesting the boys in natural history he *wrote out* monthly a little periodical called *The Naturalist*. Probably it recorded such achievements as the discovery of *Listera cordata* at Langwith and of *Crocus vernus*, alas! now long since disappeared, on Knavesmire. In 1834 Lovell Squire left York but the seed he had sown flourished, and in the harvest tide of that year the Natural History Society was formed.'

Through the good offices of Mr. Norman Penney, of the Friends' Reference Library in Bishopgate, I have been able to see this publication. He traced it in the Bootham School, York.

The journal consists of twelve numbers, each beautifully written in two columns on sheets of foolscap, eight or ten sheets, stitched in a cover, forming a part. These were evidently lent out among the boys, as instructions are given to exercise care in handling the dried plants, most of which still remain in the sheets. The first part is dated '7th day, 6 month, 14th, 1834' (Saturday, June 14th).

There is an excellently drawn title-page, and the publication is dedicated—

To
JOHN FORD,
as a slight acknowledgment
of the encouragement which he has given
to the Study of
NATURE
and those pursuits connected with it,
as well as for much personal kindness,
This little work
Published in York School
is presented
by his sincere and obliged Friend
The Editor.

Copy of the MS. Title-page of *The Naturalist* issued in the York School in 1834.

Our monthly journal, *The Naturalist*, is considered by Mr. Roebuck* to have started in January, 1833, when the first part of

THE FIELD NATURALIST

was published, 'A review of animals, plants, minerals, the structure of the earth, and appearances of the sky.' It was an octavo monthly illustrated magazine, averaging 48 pages, edited by James Rennie, and published by Orr and Smith, London. The first volume contained 12 monthly parts (552 pp., Jan.-Dec.) and the second volume contained the four parts, January-April, 1834, (220 pages). It ceased with its fourteenth issue. A title page was issued, dated 1835, with the words 'Two Volumes in One.' An index appeared to 'vols. 1 and 2,' at the conclusion of which is 'The End,' so that clearly no more were issued. It is pleasing to state that this publication gave the part and number of the volume on each sheet, and the date was printed on the first page of each month's issue, so that its collation has been an easy matter.

This was followed by

THE NATURALIST.

The first printed publication that I have been able to trace with this title, consisted of five royal 8vo volumes, published between October 1836 and September 1839. Volume I., edited by B. Maund and W. Holl, and published by R. Groombridge, London. (October 1836—March, 1837), contained 291 pages; Volume II. was edited by Neville Wood, and published by Whittaker & Co., both of whom were connected with the journal in their respective capacities until the end of the series. The volumes contained :— II., April—December, 1837, 506 pages; III., January—September, 1838, 505 pages; IV., October, 1838—June, 1839, 504 pages; and V., July—September, 1839, 171 pages. Thus thirty-six monthly parts were issued, averaging 50 pages each; as well as illustrations in the text, there are several excellent coloured plates of rare birds, etc.

As in the case of its predecessor, with the exception of a few of the earlier numbers, each part published was clearly numbered and dated.

From Volume II. (1837) the publication can be said to be a distinctly Yorkshire production, as Neville Wood lived at Campsall near Doncaster, and apparently the journal was printed in Doncaster, for in an 'editorial' dated August 26th, 1839, we read: 'On the completion of the third year of the existence

* Mr. W. Denison Roebuck, in his address on 'Salient Features in the History of the Yorkshire Naturalists' Union,' 1904, p. 10, speaking of our journal, says 'The first series was one of twelve numbers, published in 1833, under the title of "The Field Naturalist."' Presumably Mr. Roebuck had seen the first volume only.

of this journal, and more especially on the removal from Doncaster of the printer hitherto employed, it has become necessary to enquire into the expediency of discontinuing the work. . . . The result of this enquiry has been that the expenses of the magazine still so greatly exceed the receipts, as to compel the relinquishment of the undertaking.'

Neville Wood dedicated his first volume (i.e., Vol. 2 of the series) to Edwin Lees; the next to J. W. Childers, of Cantley Hall, Yorks.; and his next to Charles Waterton, of Walton Hall, Yorks.

The Naturalist (Second Series).

In 1851 another series of *The Naturalist* 'a popular monthly magazine, illustrative of the animal, vegetable, and mineral kingdoms,' appeared, and reached eight annual volumes. The first five volumes were edited by Beverley R. Morris, of York,* the remaining three by F. O. Morris, of *British Birds* fame, also a Yorkshireman.

The first number (1851) contains the account of a meeting of the *Yorkshire Naturalists' Club*, which 'met as usual at Mr. Graham's, in Lubbergate, York.' There were present D. Ferguson of Redcar, F. Gibbes of Northallerton, Baines, Charlesworth, Dr. Morris, T. Allis, Richardson, and Graham.

There are many well-known names among the contributors to this series, such as Thomas Edwards, T. Foggitt, J. H. Gurney, the two Morris's, T. G. Bonney, C. Waterton, T. Southwell, F. M. Burton, H. Doubleday, A. Strickland, H. Denny, A. M. Norman, H. Saunders, R. A. Julian, and T. S. Cobbold.

Like its predecessors, this series contained several excellent coloured plates. The following are particulars of the pages, etc.:—Vol. I., 252 pages; II., 295; III., 284; IV. 284; V. 286; VI., 291; VII., 286; and VIII., 314.

The Naturalist (Third Series).

In Huddersfield, in May, 1864, was published part I. of *The Naturalist*, a sensible 8vo publication; all subsequent issues have adhered to this size, and have not fallen a victim to the prevalent craze for enlarging the size of the pages.

The second title of the publication was 'Journal of the West Riding Consolidated Naturalists' Society [the predecessors of our Union], and manual of Exchange in all Departments of Natural History. With which is incorporated the Entomologists' Journal.'

No editors' names appear, but it was edited by our old friends, C. P. Hobkirk, and Geo. Tindall: the latter being the printer and publisher.

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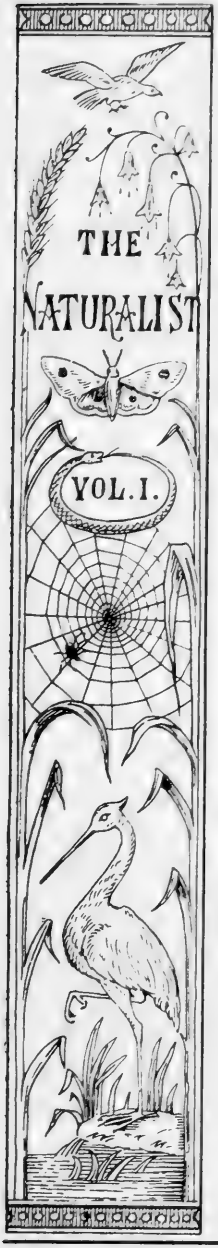
* I notice in the part for January, 1854, 'letters, etc., are to be addressed to Beverley R. Morris, Esq., M.D., Driffield.'



Design on the back of the covers of Vols. I. and II. of *The Naturalist*, Third Series, 1864-6.

On the first page of part I. we read :— 'At the commencement of our career it is perhaps necessary to make our readers acquainted with the reasons which have induced us to embark in a boat which has twice suffered shipwreck. . . . The demise of the 'Weekly Entomologist' left a gap in Entomological literature which was keenly felt by the working student . . . . as well as of its predecessor the 'Entomologists' Intelligencer' . . . . Although the two former Entomological periodicals failed through lack of sympathy and encouragement . . . . there is reason to believe that a Magazine . . . . on the more extended basis of Natural History in the widest signification of the term . . . would have a much better chance of success.'

The first volume contained the parts from May 1864, to May 1865 (380 pages), and, quite appropriately, had as a frontispiece, coloured illustrations of varieties of the Current Moth, *Abraxas grossulariata*, in connection with a note by J. Varley. This is drawn by C. P. Hobkirk.

Volume II., May 1865, to May 1866 (366 pages).

Before the completion of Vol. III., however, the boat is wrecked again! The title page says: 'Vol. III., from May 1866, to May 1867,' but there were only 184 pages. On my copy (which was Mr. Hobkirk's own; I bought it together with several of his books) is written: 'this volume was never completed.* This volume is scarce.' With the final part, under the head of 'Requiescat in pace' we learn: '*The Naturalist* is dead. This issue is our last, at any rate for the present. We regret extremely the stern necessity which will thus sever the pleasant and agreeable connection that has existed during the last three years between ourselves and our contributors. . . . But . . . . the plain truth is that

* So far as I can see it is complete, with index, etc., though with fewer pages each part, apparently for the sake of economy.

the circulation is not sufficient to pay the expenses of its production.' There is quite a Yorkshire straightforwardness about that statement!

After a few years' rest, we find our West Riding friends entering upon a fourth series, under the title

THE YORKSHIRE NATURALISTS' RECORDER.

From the title page we learn that this was the 'Journal of the West Riding Consolidated Naturalists' Society, edited, according to a title page in my copy, by Joseph Wainwright, F.L.S., July 1872 to August 1873. All published. Wakefield,* J. Wilcock, Northgate, 1873.'

From the first part of this it is apparent that the editor has our old friend the boat in view, as he states the paper 'is now *launched* on the changeful *waves* of public opinion.' The publication of the journal is the result of a desire that the members of the Consolidated Society should have a boat of its own. Part I. contained 20 pages, but later 16 was the average.

With part XI. for June 1873, under the heading 'Original Articles. To our Readers, Contributors, and Friends,' we find, 'With the issue of the present number the 'Yorkshire Naturalists' Recorder' completes its first year of existence. . . . Notwithstanding the great pecuniary sacrifice sustained, it has been decided to make the Recorder a *Two Years Volume.*' This wish, however, was not consummated, as with part IV. for August 1873 (the last page being 223), the good ship was again wrecked, without any explanation or reason being given. It was apparently unexpected, as the last part contained articles 'to be continued.' From the title page of the volume already quoted, it is apparent that this is 'all published.'

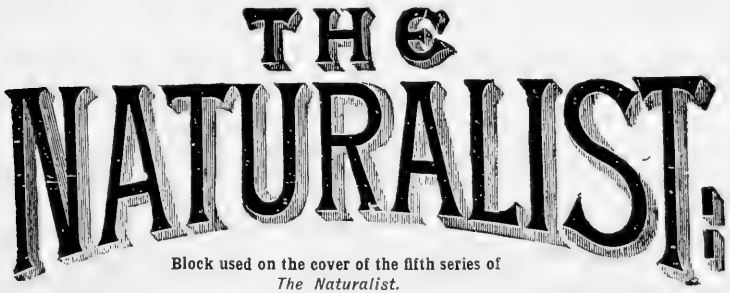
From many notes in the journal, however, this incomplete volume is of considerable value. The first article was on the 'History and Progress of the West Riding Consolidated Naturalists' Society, from its Origin (1861) to the present time (July 1872).' This History, which is the only one extant, was 'by J. M. Barber, Honorary Secretary to the Society,' and was continued in small instalments through the various parts. Unfortunately by the time the boat ran aground, Mr. Barber had only reached the year 1867. Another valuable feature is a record of the meetings of the various Yorkshire societies forming the 'Consolidated' society. There is not an index, but a 'List of Contributors' (16 names), viz., J. Abbott, J. M. Barber, J. R. S. Clifford, E. Foxton-Firby, J. Grassham, C. H. [?. P.] Hobkirk, F. A. Lees, T. Lister, J. H. Martin, G. Mawson, S. L. Mosley, C. H. Raynor, J. Sim, W. Talbot, E. Taylor and J. Tindall.

* Mr. Roebuck, in the address already referred to, say it was printed, edited and published at *Heckmondwike*—presumably an error for 'Wakefield.'

As a frontispiece to the volume is a map of 'The West Riding of the County of York, shewing the River Drainage, C. P. Hobkirk, 1871.'

THE NATURALIST, (FIFTH SERIES).

In August 1875, *The Naturalist* as now constituted appeared, our present journal being a direct and uninterrupted continuation thereof, notwithstanding changes in editorship and place of publication. It was at first a 16-page monthly, and after the first part each was dated on the first page. From the 'Address' on page 1, it was apparent that the 'Societies in the Union of the West Riding Consolidated Naturalists' Society' arranged to call it *The Yorkshire Naturalist*, but previous to the part appearing before the public, it was decided to omit the word 'Yorkshire,' though it is admitted it had then, and has had ever since, a distinctly Yorkshire bias!



Block used on the cover of the fifth series of *The Naturalist*.

Volume I. of the present series, was also 'the Journal of the West Riding consolidated Naturalists' Society and General Field Club Recorder.' It was printed, published and edited in Huddersfield, the editors being C. P. Hobkirk and G. T. Porritt. It contained 12 monthly parts (to July 1876). By the time the title page of Volume II. was printed it became the 'Journal of the Yorkshire Naturalists' Union,' the Yorkshire Naturalists' Union, as such, being constituted at Pontefract on April 2nd, 1877.

With the same editors and printers, *The Naturalist* completed its 9th volume of the New Series, for 1883-4. The pages were: Vols. I. to V., 192 each; VI., 196; VII., 208; VIII., 192; and IX., (1883-4), 220. Illustrations were very rare, most of the volumes having none. Reports of the societies were a strong feature. At the close of this ninth volume we find a very interesting paragraph. The craft had steered clear of rocks! The journal appeared punctually every month, and what is more, there had been a small balance in hand at the close of each year. Other urgent duties induced the editors to resign, but they found competent successors before they did so.

The publishing and editing of the journal was then transferred

to Leeds, and we find the title modified to *The Naturalist, a monthly journal of natural history for the north of England.*

It was edited by W. Denison Roebuck and W. Eagle Clarke, and their first volume (vol. 10 of the new series) contained 16 monthly parts, from August 1884 to December 1885 (376 pages). This enabled No. 11 and future volumes to cover the year, January to December, which was convenient. After four years of this dual editorship, Mr. Eagle Clarke's appointment to the Museum at Edinburgh caused him to resign his position, and from 1889 to 1902 it appeared under the editorship of Mr. Roebuck, with the assistance of specialists in different departments, except for the year 1892, when Mr. E. R. Waite was his colleague.

After its removal to Leeds the journal contained 32 pages monthly, and occasionally had an illustration. During his

Block at present used on the cover of *The Naturalist.*

editorship, Mr. Roebuck made the publication of bibliographies and lists of various kinds a strong feature, and frequently these have been found of great service to students and specialists.

On Mr. Roebuck's resignation in 1902, the printing, publishing, and, to a fair extent, the editing of the journal were transferred to Hull.

The new features included many plates and illustrations in the text, and supplements with extra pages; in addition to which the Union has been relieved of the financial anxieties which it formerly enjoyed. An attempt has also been made to copy what were considered to be the good features of *Natural Science*, in the form of Notes and Comments, news items, and reliable reviews of books. We have just completed our 12th annual volume at Hull.

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With the January number *The Quarry* commences its twentieth volume.

We have received from the Birmingham and Midland Institute Scientific Society their *Records of Meteorological Observations taken at the Observatory, Egbaston*, 1914, by Mr. Alfred Cresswell, Curator of the Observatory, price 2/-, which is a very useful compilation, and is illustrated by many charts in colours.

A DIARY OF ORNITHOLOGICAL OBSERVATIONS IN BRITTANY.

EDMUND SELOUS.

WHILST residing in Brittany, I made some observations on the domestic habits of various small birds—mostly belonging to the Warblers. Those which here follow I believe refer to the Melodious Warbler, since on seeing a set-up specimen of this species, though the colouration was wan and faded, I was instantly struck by the strong resemblance, or rather identity of the shape and general appearance—more particularly in regard to the head and bill—with that of the birds that I watched. The nest (open—not domed) was also very similar to the one of theirs, which I took, after the family had left. When, however, I turned to the description of this species in the classified notes of vols. 4 and 12 of 'The British Bird Book,' I was unable to reconcile it either with the actual stuffed example or my recollections from the life. An illustration of the Marsh Warbler might also very well have represented my birds, but here again the letterpress gave a still more inconsistent account, nor could I find any other which seemed to fit. I have, therefore, failed to identify the species, though I still suppose it to be *Hypolais polyglotta*. Personally I do not think the uncertainty very much matters, since I probably saw nothing that was not representative of the genus. My own field description of the birds I watched (dated July 16th), is as follows:—Head and upper surface, generally light brown, darker on wings; pale yellow eye-stripe; throat and whole under surface of a pale yellow (lighter on sides) except the under rectrices, which are brown; legs light brown; beak, brown, but under mandible much lighter than upper one, so that it looks almost pinkish. The beak is pointed and dagger-like, and long in proportion to size of bird, so that, in some actions, the head and beak have almost a Kingfisher-like appearance. The eye is black. The yellow colour I have spoken of, on the under surface, though it strikes one as the bird's chief characteristic, is, after all, very pale, so that, in the female, which is paler coloured than the male, it approaches to white. The plumage—and this too, is a marked feature—has a sleek and glossy appearance, as if it had been oiled and polished. This last, indeed, is a distinguishing trait of the family, but it appeared to me to be more marked in this species than in any other I have seen, though I dare not take the responsibility upon me of saying how much more.

MAY 22ND, 1909.—A Warbler that I have several times seen here, but which is not, I think, one of our British ones (though doubtless like the Ibis and Griffon Vulture, included in

the list) was, to-day, collecting insects, that is to say, catching one after another, and retaining them all in its bill. This was, no doubt, to feed its young with, yet it did not, by its movements, give me any clue to the nest. This Warbler has a pretty song, but I do not find it either so sweet or so rich as that of the Garden Warbler.

June 9th.—The song of my yellow-throated Warbler—for the hue seems brightest on the throat—is often ushered in by a long-drawn 'too-i, too-i, too-i, too-i,' and there are numerous other sounds, such as 'twee, twee, twee, twee, tweer-leveer,' etc., distinct from the actual warble, and generally preceding it. The bird is still in full song, but it has changed its habits, as well as its locality, for it is now always hidden.

June 12th.—My object now is, if possible, to find the nest, and see something of the domestic economy of this Breton Warbler, still constantly singing here.

June 20th.—I watched these Warblers for some time, again, this evening, from about 5-30 but failed, as before, to find any nest. Where are the females?—for unless they, too, sing, I can hardly have seen a single one. There are two or three about here (in the valley), but I never watch any of them for long without its singing, though the song is now much deteriorated. I can never see one, with either food or nesting material in the bill, both of which would argue, even if they did not prove the feminine. Incubation, of course, remains, but all the hens of the males I have watched cannot have been incubating all the while. These Warblers seem to be much more fly—or gnat—than caterpillar-catchers. I have, however, from time to time, seen them search a leaf, though not yet catch a caterpillar.

June 21st.—I thought this morning that I had located the nest of a pair of these Yellow Warblers that haunt a bramble and willow brake, enclosed in a little quiet valley here, through which—that is to say just this part of it—a tiny stream rather oozes than flows. One of the two went repeatedly to a certain spot amidst bracken, often flying near about in the betweenwhiles, catching insects on the wing—as far as I could judge, at least. This I took to be the female, not only as being the more domestically inclined, but by her quieter and less bold manner and lighter song—for she did sing once or twice if not oftener. She also broke out occasionally into the same harsh rattling note, indicative of displeasure or apprehension. Through the glasses she looked both smaller and paler than the male, a subdued edition of him so to speak. The latter also went down once into this same place, but it was after her, and as he seemed to me afterwards to be pursuing her amidst the bracken, I think the motive was a conjugal rather than a domestic one, especially as the same thing was repeated once,

not quite at the spot. However, this may be a mistaken inference.

Having watched many of these visits, and always seen the braken move in just this one place wherever else the bird went to, I at last walked up to it, but, instead of the nest, found a bird certainly quite full-fledged and resembling the parents, more especially the female, but with a certain young appearance not to be mistaken. It flew a little way as I came up, in the ordinary immature manner. I could not find any nest. It is plain, from this, that the female at any rate, if not the male bird also, has been occupied in feeding the young, and that, at least, one of the latter has left the nest; if the last to do so, this would account for his still being near it.

It was the same this afternoon. The young are now certainly being fed in various places, and sometimes the mother seems to have a difficulty in finding where the one or the other of them is. They utter, however (I suppose at least, that it comes from them) a plaintive cry more resembling a mew than a chirrup. Again it seems to be the female who does either all or most of the feeding, though the male is about in the neighbourhood, and the two converse, as it were, in answering snatches of song. I believe it is flies that the young are mostly fed on, though, as with other Warblers, caterpillars may play their part, and this seems only probable. Still, whenever I have seen anything in the parent's beak, I have not been able to make out that it was a caterpillar.

June 22nd.—This morning there is much less to be seen of the feeding operations carried on by these birds, and what there is suggests that the young are getting further afield, and becoming more and more emancipated. Like the Whitethroat, this bird has, besides its song (which, however it be more praised, never seemed to me so sweet and rich as that of the Garden Warbler) a remarkable rattling sort of note very loud and continuous, which would popularly be called the alarm note, though, as with other birds, whose cries are thus labelled, it seems by no means always to express fear or anxiety. It is something like the analogous note of the Garden Warbler, but a more continuous, undivided sound, as if inside the bird's body there were a small policeman's rattle, that kept on going round, whereas that of the latter species is more syllabic like a quickly repeated 'tut, tut, tut, tut, tut.'

July 6th.—There are signs now, of a pair of these Warblers either having or contemplating having a nest here, but, if they have, I hardly expect to discover it. It is the same place and the same vicinity as a fortnight ago, but whether the birds are the same, and can have come on again thus rapidly, I know not.

(*To be continued*).

In Memoriam.

THE REV. F. H. WOODS, B.D.
(1850—1915).

FROM the time the Rev. F. H. Woods came to Yorkshire a few years ago, he took a very keen interest in the natural history of

the county. Always a keen collector, he had an eye for beauty, and although his inclinations led him in various directions, he devoted his attentions mainly to those objects which he considered to be the most beautiful, and he had an extensive collection of shells, wild flowers, and birds' eggs. Some time ago he called at the Museum at Hull in connection with local marine shells, and on our suggestion he at once commenced systematically collecting Yorkshire coast mollusca. He also prepared a list of the marine mollusca of our coast (*Transactions Hull Scientific and Field Naturalists' Club*, vol. iv., part 5,

pages 231-250 ; reprinted as a Hull Museum publication, No. 91). This list included all the known marine shells of Yorkshire, and subsequently Mr. Woods paid more particular attention to the almost microscopical mollusca, and added many further species to the list. While he placed the best, and in many cases the only local examples in the Museum at Hull, where the collection is specially set apart, he has given specimens to the Beverley and other museums. His own collection was an extensive one, including specimens from different parts of the country.

With his wild flowers Mr. Woods had infinite patience, and was successful in preserving many of the most difficult species in their natural colours.

In 1904 he became a member of the Yorkshire Naturalists' Union, and since then he has taken a prominent part in the organization of the Marine Biology Committee. He was a regular attender at the Yorkshire Naturalists' Union meetings and excursions, and has also on many occasions given lectures, and conducted excursions, for the Hull Scientific and Field Naturalists' Club and other similar bodies.

He frequently asked his naturalist friends to his home at Bainton on the Wolds, where they always enjoyed examining his extensive collections.

Mr. Woods was the Rector of Bainton, was educated at Oxford, and in 1910 the present Archbishop of York made him one of his examining chaplains. He was an exceptionally hard worker, very enthusiastic, and will certainly be missed by many of the readers of this journal.

The following notes from his pen appear in *The Naturalist* : ' Conchology at Pocklington ' (September 1905, page 267) ; ' Marine Mollusca at Robin Hood's Bay ' (June 1907, pages 201-2) ; ' Birds of Thorne Waste ' (September 1907, page 318) ; ' Marine Conchology at Hornsea ' (August 1908, page 308 ; also October, page 386) ; ' Marine Conchology at Runswick ' (September 1909, page 311-312) ; ' Marine Biology at Redcar ' (November 1910, page 408-410) ; ' Report of Marine Biology Committee, 1910 (January 1911, page 57-58) ; ' Marine Biology at Scarborough ' (Dec. 1911, page 420-422) ; ' Marine Biology at Bridlington ' (July 1912, pages 216-217) ; ' Marine Shells at Bridlington ' (Oct. 1912, page 302) ; ' Adeorbis subcarinatus, at Scarborough ' (Dec. 1912, page 361) ; ' Yorkshire Marine Biology Committee at Robin Hood's Bay (December 1912, pages 368-370) ; ' Annual Report of the Marine Biology Committee, 1912 ' (January 1913, page 81) ; ' Marine Biology at Filey ' (October 1913, pages 364-367) ; ' Yorkshire Marine Mollusca ' (December 1913, page 411) ; ' Report of the Marine Biology Committee ' (January 1914, page 29-30) ; ' Rare Shells at Filey ' (April 1914, page 130) ; ' Marine Biology at Filey '

(August 1914, page 254) ; ' Marine Biology at Whitby ' (November 1914, pages 358-359).

In the *Journal of Natural Science* (Hull) he wrote ' Among the Birds of Shetland ' (volume i., No. 1, pages 26-28, July to September, and vol. i., No. 2, pages 39-44).

Mr. Woods is also responsible for the following works on theology, travel, etc. :—1880-82, ' A Guide to the Study of Theology in Oxford ' ; 1882, ' Sweden and Norway ' ; 1882, ' Canons of the Second Council of Orange ' ; 1896, ' The Hope of Israel ' ; 1906, ' For Faith and Science ' ; 1887, Joint Translater with Rev. J. O. Johnstone of ' Three Anti-Pelagian Treatises of St. Augustine ' ; 1888, ' The Civilisation of Sweden in Heathen Times ' (translated from the Swedish) ; 1885-91, Contributor to ' Studia Biblica et Ecclesiastica ' ; 1898-1900, ' Hastings Dictionary of the Bible ' ; and 1908-1912, ' Hastings Encyclopaedia of Religion and Ethics ' ; 1909-12, Joint Editor of ' The Hebrew Prophets for English Readers.'

T. S.

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Roman and other Triple Vases. By **Walter H. Kaye, jun.** London : Elliot Stock, 40 pages, 2s. net. Some little time ago Mr. Kaye contributed notes to *The Antiquary* on ' Curious Triple Vases,' which principally dated from Roman times. Sometimes these occur on separate bases and sometimes these vessels are placed on a common base. Illustrations of typical examples are given, and by far the largest proportion has been found in the northern counties. Of the 32 recorded as known, 8 are from Carlisle ; 3 from Warrington ; 3 from York ; 2 from Chester, and one each from Ilkley, Durham, South Shields and Newcastle-on-Tyne. The little volume is well bound.

Australasian Fossils. By **F. Chapman.** London : G. Robertson & Co., 341 pages, 7s. 6d. net. Mr. Chapman's position as Palæontologist to the National Museum, Melbourne, enables him to speak with some authority on the fossils of the great island continent. The present book, ' a manual of palæontology for students,' will doubtless be of great service to workers in Australia. After the general introduction, in which comparison is made with British deposits, the author reviews the various strata, and illustrates his remarks by a large number of diagrams and blocks from photographs, etc. The English student desirous of obtaining knowledge of the palæontology of the Antipodes will do well to peruse the book. Mr. Chapman gives full references to the literature, and the volume is well indexed.

Geological Excursions Round London. By **G. M. Davies.** London : Thomas Murby & Co., 156 pages, price 3s. 6d. The meetings of the London Geological Field Club which were held for many years, as well as the excursions of the Geological Association, etc., have demonstrated that a keen interest is taken in the geology of the unusually interesting area around London. The information thereon however, is somewhat scattered in different Societies' Transactions. In the present volume Mr. Davies has brought this information together and has added many notes and observations of his own. The book is well illustrated by photographs, and there is also a coloured geological map of the south-east of England as a frontispiece. Mr. Davies gives a general account of the stratigraphy of the south of London, and follows with particulars of excursions in the London basin, the Weald, and beyond the Chilterns.

In Memoriam.

BENJAMIN HOLGATE, F.G.S.
(1838—1915).

We regret to record the death of Mr. Benjamin Holgate, of

Leeds, a life member of the Yorkshire Naturalists' Union, and one of the oldest members of the Union.

He was well-known in the local engineering and scientific circles, and was one of the sons of the oldest working engineer in Leeds.

He took a general interest in geology, more particularly in the rocks of the Carboniferous formation.

He was a Fellow of the Geological Society; a member of the Yorkshire and Leeds Geological Societies; The Leeds Naturalists' Club (of the last two he was a foundation member, and a past president); and also of the Leeds Co-operative Naturalists' Club; the last saw him a good deal.

Mr. Holgate frequently contributed notes dealing with the geology of Leeds district to *The Naturalist*, to the Transactions of the Leeds Societies, and two papers were read by him at the last meeting of the British Association held at Leeds.

He was one of those usually described as a 'self-educated man,' and certainly his knowledge of the geology and natural history of his district enabled him to frequently conduct parties interested in these subjects. He was just over 77 years of age.

The following is a list of his contributions:—

Proceedings Yorkshire Geological Society.—'The Minerals of the Yorkshire Coal-field as applied to the modern manufacture of Iron,' 1877; 'Some Physical Properties of Coal,' 1890; 'The Mode of Deposition and Properties of the Carboniferous Strata of Leeds and its immediate suburbs,' 1892.

The Naturalist:—'Geology of Grassington,' 1891; Boulders at Scarborough,' and 'Geology of Rokeby,' 1892.

Transactions of the Leeds Naturalists' Club and Scientific Association:—'Points of Comparison between Limestone, Flint, and Iron-stone Nodules' (1886).

Transactions of the Leeds Geological Association:—'The Geology of Leeds' (part 1); 'The Lower Coal Measures of Leeds' and 'Notes on the Geology of Bournemouth' (part 2); 'Notes on the Lake District' and 'The Magnesian Limestone of Yorkshire' (part 4); 'A Long Buried Oak' (part 6); 'Some Examples of Change in Rocks caused by the Permeation of Underground Water' (part 8); 'A Geological Study in the Horsforth Valley' (part 10); 'Coal Measure Plants'; 'Geology of the Meanwood Valley and District to the North of it'; and 'Some Points of Comparison between Plants of the Present and those of the Coal Measures' (part 11); 'Description of Plates showing Sections in Coal Measures of Leeds' (part 14).

Report of the British Association (Leeds Meeting), 1890:—'The Carboniferous Strata of Leeds and its Immediate Suburbs,' and 'Some Physical Properties of the Coals of the Leeds District.'—T.S.

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Professor T. McKenny Hughes has an interesting paper on 'Flints,' in the **Proceedings of the Cambridge Antiquarian Society,** recently issued.

Amongst the contents of the **Transactions of the Yorkshire Dialect Society,** volume 3, part 16, we notice: 'Popular Speech and Standa English,' by Mr. P. Smith, and 'Richard Rolle: The Yorkshire Mysti by Dr. F. W. Moorman.

FIELD NOTES.

MAMMALS.

Large Porpoise at York.—A Porpoise was shot in the River Ouse at Low Acaster on February 4th, 1915, by a keelman as he was bringing his vessel up to York. It was five feet long, had a girth of three feet, and weighed 122 lbs. I understand the carcase was taken to Bishopthorpe for the purpose of tanning the skin and boiling out the oil.—SYDNEY H. SMITH, York.

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BIRDS.

The Misdeeds of a Kingfisher.—A friend of mine recently constructed a rock garden, almost in the centre of Harrogate. An ornamental pool was well stocked with gold fish, many of them smallish in size. Although the pond is situated quite a mile and a half, as the crow flies, from the nearest stream frequented by Kingfishers, and to reach it, it would be necessary for a bird to pass over many houses, yet in some mysterious manner a Kingfisher has discovered the little 'gold mine' and by frequent visits, has so far accounted for over a hundred of its inhabitants.—R. FORTUNE.

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FUNGI.

***Phoma acicola* (Lév.) Sacc., in Yorkshire.**—In June of last year Mr. Samuel Margerison forwarded to the Natural History Mueum a consignment of diseased Scots Pine. On some of the dead and dying leaves were present a number of pycnidia, which on examination proved to be *Phoma acicola* (Lev.) Sacc. This fungus appears to have been only once previously recorded for this country: in that case it occurred on leaves of Scots Pine at Marston Green, Warwickshire (W. B. Grove, *Journ. Bot.* L., 1912, p. 50). The fungus was found by Mr. Margerison on wind-sown pines in Sawley High Moor Plantations, 7 miles west of Ripon. Another fungus, *Hormiscium pithyophilum* (Wallr.) Sacc., which seems to be unrecorded for Yorkshire, was also present on some of the leaves forwarded. *Phoma herbarum* is reported to have occurred on rasp-canes at Grantley, last year.—J. RAMSBOTTOM.

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MOLLUSCA.

Marine Shells from the Ancient Beach at North Somercotes, Lincs.—Underlying the village and warren of North Somercotes on the Lincolnshire Coast is an ancient shingle beach. On the area known as 'the Warren' this beach is overlaid with blown sand, in some places to a height of 20 feet to 30 feet. In the village excavations were made for the purpose of obtaining the shingle, which is about 4 feet in

depth. On the occasion of a visit by members of the Louth Naturalist's Antiquarian and Literary Society to the Warren, four of their number paid a hurried visit to the excavations. As there seems to be no record, as far as we know, of this beach, except the incidental reference to its existence in the Memoir of the Geological Survey, it is desirable to place on record the list of shells obtained on this hurried visit.

Mytilus edulis. Portion of one valve.
Ostrea edulis. Very abundant.
Pecten varius. Rather common.
P. opercularis. One valve.
Macoma (=*Tellina*) *balthica.* Common.
Mactra stultorum. One valve.
Spisula (=*Mactra*) *solida.* Rare.
Cardium edule. Abundant.
Mya truncata. One valve.
Gibbula (=*Trochus*) *cineraria.* Rather common.
Calliostoma (=*Trochus*) *zizyphinum.* One broken example.
Littorina obtusata. One example.
L. rudis. Rather common.
L. littorea. Common.
Trivia (=*Cypræa*) *europæa.* One example.
Buccinum undatum. Common.
Ocinebra (=*Murex*) *erinacea.* Rather common.
Trophon truncata. One example.
Purpura lapillus. Abundant.

C. S. Carter, Louth.

———: o :———

The Museums Journal for March contains a paper by E. Howarth, F.Z.S., of Sheffield, on 'The Museum and the School.'

'Notes on the Habits of the Fulmar Petrel,' by O. G. Pike, appear in *British Birds* for March, and are well illustrated.

Man for March contains an excellent portrait of the late Frederick William Rudler, I.S.O., together with a notice by Sir Edward Brabrook.

The Zoologist for February includes 'A Diary of Ornithological Observations made in Iceland during June and July, 1912,' by Edmund Selous.

In *Annotationes Zoologiæ Japonenses* there are papers on Japanese Echinoderms, East Indian Termites, and Japanese Myopsida, all of which are illustrated.

Mr. Arthur Bennett has favoured us with a copy of his notes on 'The Potamogetons of the Philippine Islands,' reprinted from *The Philippine Journal of Science.*

In *The Lancashire and Cheshire Naturalist* for February is a record of '*Lunularia cruciata* with Male Inflorescence in East Cheshire.' Reference is also made to Yorkshire specimens.

The Entomologist's Monthly Magazine for March is an unusually large number and is sold at 2/-. It includes plates illustrating details of British Siphonaptera. The paper on this subject, by the Hon. N. Charles Rothschild, M.A., occupies the greater part of the publication.

Some Geographical Factors in the Great War

By T. HERDMAN, M.Sc., F.G.S.

(Lecturer in Geography, Municipal Training College, Hull).

72 pages, crown 8vo, with 6 Maps, sewn in stout printed cover, 9d. net, post free 10d. net.

A feature of vast importance in the titanic struggle now taking place is the geographical condition of the various countries. In "Some Geographical Factors" the author provides much interesting information which helps his readers to a wider understanding of an important aspect of the present campaign. The concluding chapter on "The Problems of Nationality" affords a glimpse of the immense difficulties that face those statesmen to whose heads and hands will be committed the adjustment of the new boundaries.

The "Literary World" says:—"Those who would follow intelligently the movements in this world contest will find much help in this little handbook. Mr. Herdman's exposition of the part played in the war by the great land-gates and the seas is clear and informing, and is followed by some sound reasoning on the commercial war and the problems of nationality."

A Book of special interest to Naturalists.

Yorkshire Moors and Dales

A Description of the North Yorkshire Moors together with Essays and Tales,

By ALFRED P. WILSON.

248 pages, size $8\frac{3}{4}$ *by* $6\frac{1}{4}$ *inches, and 12 full-page plates on Art Paper, tastefully bound in cloth boards, lettered in gold, with gilt top,* **10/6** *net.*

The district covered by the North Yorkshire Moors is one of the most interesting parts of Yorkshire, and this book ably portrays the charms of a visit to the neighbourhood. There is no other place in England so rich in antiquities, and most of these are herein described.

Part I. serves as a guide to the visitor, and brings to his notice the objects of interest throughout the district.

Part II. forms a series of Essays, and, besides other subjects, deals with the following :—

The Dalesfolk.	**Old Customs.**	**Local History.**
Moorland Roads.	**Wild Nature.**	**Dialect, etc., etc.**

Part III. consists of a number of stories which further describe the characteristics of the dalesfolk.

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THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
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THE MUSEUMS, HULL;
AND
T. W. WOODHEAD, Ph.D., F.L.S.,
TECHNICAL COLLEGE, HUDDERSFIELD.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

J. GILBERT BAKER, F.R.S. F.L.S., GEO. T. PORRITT, F.L.S., F.E.S
Prof. P. F. KENDALL, M.Sc., F.G.S., JOHN W. TAYLOR,
T. H. NELSON, M.B.O.U., RILEY FORTUNE, F.Z.S.

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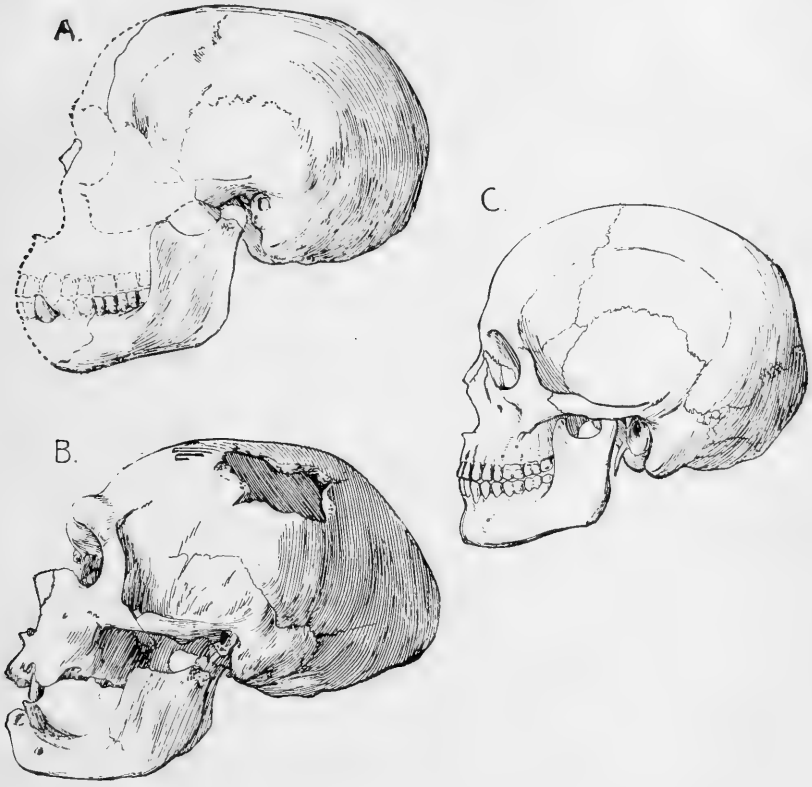
NOTES AND COMMENTS.

FOSSIL REMAINS OF MAN.

Under the above heading the authorities at the British Museum (natural history), have issued a remarkably cheap guide, which contains 33 pages, four plates and twelve text figures. It is sold at the low price of 4d. Written by Dr. A. Smith Woodward, it can be taken as most authoritative and



reliable. The illustrations of the various important remains of early man are remarkably clear, and special prominence is given to the Piltdown specimens, which are now in the national collection. We are permitted to reproduce one of the illustrations herewith, which shows left side view of the Piltdown skull (*a*) ; the Neanderthal (Mousterian) skull from La-Chapelle-aux-Saints (*b*) ; and a modern human skull (*c*), the second after M. Boule ; one quarter natural size. The lower jaw of the La-Chapelle skull is altered by the loss of the teeth and disease.

DR. A. SMITH WOODWARD'S ADDRESS.

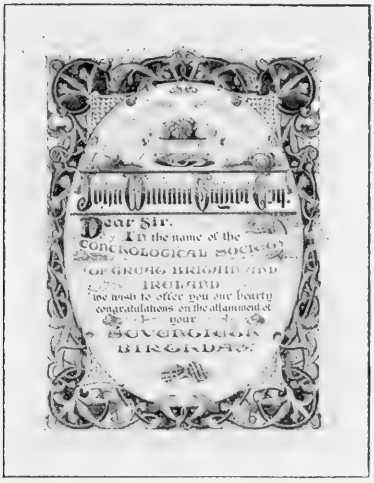
In his recent Presidential Address to the Geological Society, Dr. A. Smith Woodward remarked that the progress of Geology depends on so many lines of research, that each specialist does well at times to pause and consider the relation of his own small part to the whole. He therefore reviewed some results of his study of fossil fishes in their bearing on stratigraphy. However necessary detailed lists of species of fossils might be for comparative work with sediments in restricted areas, he hoped to show that in dealing with broader questions, names were really of small importance. Certain general principles had been arrived at, which would serve for all practical purposes. Each successive great group of fishes began with free-swimming fusiform animals, of which some passed quickly into slow-moving or grovelling types, while others changed more gradually into elongated or eel-shaped types. There was also a constant tendency for the primitive symmetry of the parts of the skeleton in successive members of a group to become marred by various more or less irregular fusions, sub-divisions, and suppressions. Some of the successive species of each group increased in size, until the maximum was reached just before the time for extinction. These and many other more special inevitable changes had now been traced in most groups, and the various geological dates at which they occurred had been determined by observations on fossil fishes from many parts of the world. Even fragments of fish-skeletons, too imperfect to be named, were often therefore of value for stratigraphical purposes.

THE WAR AND SECOND-HAND BOOKS.

The war is responsible for much, but it was a little unexpected to find notes similar to the following in a list of books for sale issued by one of our leading firms :—No. 834.—Becker (Leon), ' Les Arachnides de Belgique.'—'. . . Since the information of the above work, Belgium has been overrun by the enormouse migration of a gigantic bloodsucking spider, *Kulturia Vastatrix* Treitschk, with falces of a noxiousness hitherto unknown to naturalists. Although in their new habitat these Archnida have approximated to the trap-door spiders, their expulsion and extermination is only a matter of time.' No. 835.—Beneden (Pierre Joseph van)'. . . . Animal Parasites and Messmates.' ' Like Belgium in general, Louvain in particular is suffering from the unexpected arrival of vermin of a very low type, which are unlikely to survive the freshening winds of spring.' No. 1066.—Haeckel (Ernst), ' Report on the Siphonophoræ . . .' ' This is the man who, with Dr. Eucken, put forth with his tongue in his cheek the lying statement that the French invaded Belgium before his own countrymen did.'

PRESENTATION TO MR. J. W. TAYLOR.

The Journal of Conchology for April contains a record of an interesting event which recently took place at a meeting of the Conchological Society. This was the presentation of an illuminated address to a past president of the Yorkshire Naturalists' Union, Mr. John W. Taylor, on having attained his seventieth birthday. Mr. Taylor was the founder of the Society, which started as a Leeds Institution about forty



years ago. We give a reproduction of the title page of the address herewith.

FLINTS.

In volume 18 of 'The Cambridge Antiquarian Society's Communications,' Professor T. McKenny Hughes has an interesting paper on 'Flints.' Fewer people have had greater experience than Professor McKenny Hughes, consequently his remarks will be perused by students with the greatest possible profit. In reference to the alleged artificial nature of the sub-Crag Flint implements described by Sir Ray Lankester, Professor McKenny Hughes writes :—'I must, however, say that I have failed to arrive at the same conclusion, but find that identical forms are produced under shore conditions which must have been similar to those under which the Suffolk Bone Bed was laid down.'

THE ASHGILLIAN SUCCESSION.

At the recent meeting of the Geological Society Dr. J. E. Marr read a paper on 'The Ashgillian Succession in the Tract to the West of Coniston Lake.' Dr. Marr has studied in detail

the succession of the Ashgillian strata in Ashgill Beck and the adjoining tract. An account of the lithological characters and lists of the fossil contents of the various divisions were given, and confirmatory sections from Coniston Village to Appletreeworth Beck described. A comparison was made with the beds of the Cautley district which he had previously described. Some fossils which have not yet been found in the Lower Ashgillian of the Cautley district occur in the beds of that division at Coniston. From a study of the fossils of the Coniston tract and of other areas in Britain and the Continent, it would appear that a two-fold division of the Ashgillian strata which is of more than local value may be made. The lower division is characterised by the abundance of *Phillipsinella parabola*, and the upper by the profusion of *Phacops mucronatus*.

EFFECT OF SMOKE ON LICHENS.

Mr. G. T. Porritt writes:—At a recent meeting of the Linnean Society a paper entitled, 'The Lichens of South Lancashire,' was read by Messrs. J. A. Wheldon and W. G. Travis. After referring to the enormous industrial development of South Lancashire during the last century, the authors pointed out the deterioration of the flora which had consequently ensued, and entered into details as to the results of the effects of air-pollution by coal smoke on cryptogamic vegetation, and more particularly on lichen growth. They were of opinion that South Lancashire shows the deleterious effects of smoke on vegetation over a larger area than perhaps any other part of Great Britain. In the discussion which followed, the President of the Society, Professor E. B. Poulton, remarked on the similar changes which the insect fauna in the same district had undergone, probably owing to the same causes as those which had affected the lichens. As melanism in lepidoptera (the characteristic to which Professor Poulton alluded), is probably much more prevalent in South-West Yorkshire than in South Lancashire, it would be an interesting study for our South Yorkshire botanists to investigate and ascertain whether our lichens have also been affected as in South Lancashire.

GEOLOGISTS IN BOWLAND.

The members of the Yorkshire Geological Society visited the Forest of Bowland during Easter week-end, and the *Yorkshire Observer* gave the usual racy accounts of the work accomplished. From that source we learn that the old question of the origin of the Reef Knolls was discussed on the spot. Dr. Vaughan satisfied himself that the general assortment of fossils found in the knolls of Bowland was similar to the assortment of fossils found in other knolls both in Wales and in

the neighbouring country of Craven which he had previously examined, and that they were different in species and in association from the fossils found in the ordinary bedded limestones. The deduction is obvious that they represented a fauna which regularly adopted the knoll form of growth, and could not possibly have been squeezed out of other beds in the manner postulated by Dr. Marr. Such a triumphant vindication of Mr. Tiddeman's original suggestion was the chief interest of the excursion on the Carboniferous side. A further piece of evidence in support of the knoll theory was the discovery in the limestones of the Knott, near Knowlmere, of little beds of tufa. Tufa is derived from the deposition of limestone from solution practically by evaporation. Assuming that these little patches were the floors of lagoons and pools in the reef their presence is easily intelligible. It would be difficult to explain them on any other basis.

INGLEBOROUGH AND BOWLAND LIMESTONES.

Incidentally some attention was given to another problem of the locality which has been also hotly contested. Mr. Tiddeman noticed, when he surveyed the district, that the limestones in the Bowland district were extremely different from those of Ingleborough, and that the mud-stones (shales) lying upon the limestones in the two areas were also very distinctive. He quaintly compared the rocks of the two areas to the Jews and the Samaritans, who agreed in nothing but a common boundary and the determination to have nothing to do with one another. The geological boundary in the Yorkshire case he found to be the great Craven fault, that dislocation which formed the impressive wall of limestone rocks from near Skipton round to Ingleborough and beyond. It has been found by Mr. Cosmo Johns that part of the difference at least which Mr. Tiddeman found in the Ingleborough and Bowland limestones arose from the fact that they are not precisely contemporary. But difficulty has arisen with regard to the shales which form the upper part of both Ingleborough and Pendle. Dr. Wheelton Hind, writing on similar evidence of fossils, came to the conclusion that, similar as the great Yorkshire and Lancashire heights are in structure, there was a great diversity in their age, for he found evidence for the belief that the Pendleside series—as they have been called—are of later date than the Yoredales of Ingleborough and North Yorkshire.

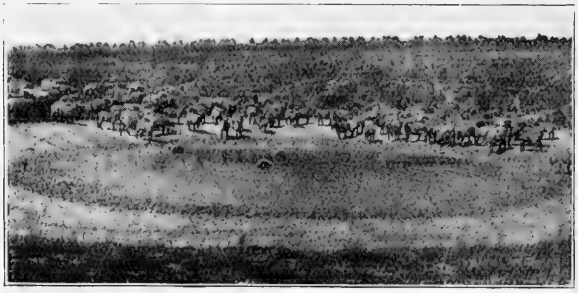
INVESTIGATION OF YORKSHIRE RIVERS.

The drainage system of Yorkshire places it in a unique position among the counties of England for carrying out a systematic research upon its water resources, and the Yorkshire Geological Society has decided upon setting such an enquiry on foot. The aims and scope of the work are set forth on a leaflet,

issued by the Society, and it is proposed to do the work in a very comprehensive manner. In order that the scheme may be carried through successfully it is necessary to enlist the co-operation of all who are interested in such work. Those who wish to help should communicate with the Secretary, Mr. A. Gilligan, the University, Leeds.

DEW PONDS.*

Mr. Martin has taken a considerable interest in these structures, and from time to time has contributed notes in different scientific journals on the subject. The present book is a summary of the information he has gathered together as to their age and history, theories, modes of construction, experiments and observation. By the illustrations given it



Sheep watering at Upper Standson Pond.

is evident that in the south of England dew-ponds are of much larger size and importance than the so-called dew-ponds on the Yorkshire Wolds. He states that when he commenced his experiments he had a strong leaning in favour of the theory of the replenishment of these ponds by dew, but he was soon led to abandon this idea, and, although there is evidence to show that considerable condensation takes place into high-level ponds other than rain, dew has, he submits, little or nothing to do with it.

DEW PONDS ON THE YORKSHIRE WOLDS.

Mr. Martin quotes the following interesting note by the late J. R. Mortimer :—' Perhaps no district of the same area contains more ponds than the Mid-Wolds of Yorkshire. These are partly ancient, partly modern. The latter can be numbered by hundreds, nearly all of which have been made during the last 150 years—mostly after the inclosures of the parishes.

* History, Observation and Experiment, by E. A. Martin, F.G.S. London : T. Werner Laurie, Ltd. 208 pages, 6s. Not dated.

Previous to that, the stock grazing on the open commons were driven to be watered at the ponds in the villages. These ponds are mostly of a circular form and of all sizes, from ten yards to fifty yards in diameter. A few are oval, to adapt themselves to the ground on which they are constructed.'

THEIR SITES.

'Their chosen sites are generally in depressions on the surface of the land, in which the rain-water has a tendency to collect, or on sloping ground, and often near the side of a high road or track-way, where the running water from the roads during rain can be conveyed by a channel or gutter into the pond. This is the means by which the ponds are supplied on the Yorkshire Wolds. No one ever thinks of filling them by any other means, the condensation of a fog or mist being a very small factor.'

THEIR CONSTRUCTION.

'In this district they are constructed as follows:—First, a dish-shaped excavation with a gentle slope to the centre, is made in the ground, to the depth of 4 to 6 feet, according to the diameter of the pond. This is then covered with quick lime, next a layer of clay, which is wetted and beaten with wooden mallets into an impervious sheet, 3 to 4 inches thick. Again a covering of quick-lime is applied, then a coating of stiff wheat-straw, and on the top of this is spread broken chalk. The two coverings of lime are to prevent earth-worms boring through the bed of clay. The bed of straw is to prevent the covering of broken chalk from being trodden, by cattle going to drink, into the impervious bed of clay, which, if not protected by the straw and broken chalk, would be pierced through, and the pond would lose its water. I believe it is generally considered that, as soon as the pond is constructed, the sooner it is filled with water the better, as, if without water for any length of time, the clay lining is liable to shrink and crack from the effect of dry weather.'

ACTION OF LIGHT UPON CHLOROPHYLL.

At a recent meeting of the Linnean Society, Mr. Harold Wager read a paper on 'The Action of Light upon Chlorophyll.' 'By making a film of chlorophyll, upon paper and on glass, by floating an alcoholic solution, and allowing it to dry, the author was able to bleach a portion under strong sunlight, and covering a portion by black paper; when this was tested by Schiff's solution, the exposed, that is the bleached portion, became pink, the unexposed portion showing no colour change. Another experiment was made by subjecting similarly bleached portions of chlorophyll to the action of potassium iodide, when the exposed parts turned reddish-blue, in consequence of the liberation of iodine, which acts upon the starch on the paper.

The experiments clearly show that the decomposition of chlorophyll is accompanied by the formation of an aldehyde and of something able to oxidise the potassium iodide and to set free the iodine. Instead of alcoholic extract of chlorophyll we may use dried leaves, or chlorophyll expressed from leaves, or layers of Euglena or algæ spread over the paper. The reactions also take place inside a leaf, if the bleaching has been efficient.'

EXPERIMENTS ON OXALIS ACETOSELLA.

'Thus if sunlight is condensed by lens upon a living leaf of *Oxalis acetosella* containing plenty of starch, the chlorophyll is bleached in a small area, and if treated with Schiff's solution, a strong aldehyde reaction results; if tested with potassium iodide the said area becomes blue. It having been stated that formaldehyde is produced when chlorophyll is exposed to sunlight in the presence of carbon dioxide, an attempt was made to determine whether such was the case in the present series of experiments, but the author was not able to satisfy himself on this point, though several of the tests succeeded even with so small an amount as one-millionth of formaldehyde. Hydrogen peroxide had been suggested as the gaseous oxidising compound of chlorophyll, but the result of many varied tests showed that this was not so.'

LONSDALEIA AND DIBUNOPHYLLUM RUGOSUM.

At a recent meeting of the London Geological Society, Mr. Stanley Smith read a paper on 'The Genus *Lonsdaleia* and *Dibunophyllum rugosum* (McCoy).' He discussed the literature, structural characters and development, descent, classification, and distribution of the corals constituting the genus *Lonsdaleia*, and gave a description of *Dibunophyllum rugosum* (McCoy). The Author's reasons for including a description of *D. rugosum* in the paper are, first, the fact that the species was originally described by McCoy as *Lonsdaleia rugosa*; and, secondly, that considerable confusion exists between it and the fasciculate forms of *Lonsdaleia*. *Lonsdaleia* is a compound member of the Clisiophyllidæ, and occurs both as fasciculate and as massive colonies. The chief distinguishing features of the genus are the wide extrathecal area, large dissepiments, complex central column, and horizontal and widely-spaced tabulæ. *Lonsdaleia* is an Avonian or Lower Carboniferous genus, especially abundant in the highest horizons of that series (D^2 and higher beds). The earliest example is *Lonsdaleia prænuntia*, from the *Syringothyris* Zone (C). A number of species and local forms have been recognized and were described.

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The spring number of *Bird Notes and News* contains a fine coloured plate of the Crossbill.

Naturalist,

ON THE OCCURRENCE OF PAULINELLA CHROMATOPHORA (LAUTERBORN) IN BRITAIN.

JAMES MEIKLE BROWN, B.Sc., F.L.S., F.C.S.,
Sheffield.

PAULINELLA CHROMATOPHORA is a small, filose, testaceous rhizopod, which is either remarkably local in its distribution, or else it has been generally overlooked.

It is of great beauty and elegance, but of small size, reaching a length of about 30 μ. On cursory examination it might be mistaken for a species of *Sphenoderia* to which it bears some superficial resemblance.

In outline the test is ovoid and very symmetrically formed

Fig. 1.

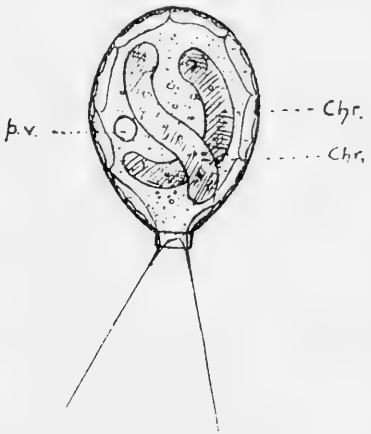

Fig. 2.

(fig. 1). It is constructed of siliceous plates, regularly disposed in five longitudinal rows, each row consisting of eleven or twelve plates. In general, the plates of adjacent rows alternate with each other and though in shape they are somewhat rectangular with rounded ends, they have the appearance of being hexagonal owing to their position relative to one another. A similar feature may be seen in the tests of *Euglypha* and *Sphenoderia*. A character not generally met with in the tests of rhizopods is the presence of a short straight collar, surrounding the narrowly elliptical mouth.

The most characteristic structure of the animal is the chromatophore, a comparatively large horse-shoe shaped body of green colour. Typically, one only is present, but as is noted below two may occur in the same individual.

The species was discovered and described first by Lauter-

1915 May 1.

born (1895), who obtained it from the Rhine, at Neuhofen (Bavaria) and from the Black Forest.

Later, Dr. Penard collected numerous specimens in Lake Geneva, and gave an excellent account (1905*b*), of the structure and habits. In a footnote to this paper, Penard mentions that it had been obtained also by Levander in a lake near Helsingfors (Finland).

It was first reported from Britain by Penard (1905*a*), who observed a single empty test amongst some material supplied to him from Loch Ness (Scotland), and obtained at a depth of 272 feet.

The present writer obtained further a number of empty tests in a small tarn—Highlow Tarn—in Lancashire (1910). This was the first record of its occurrence in England.

Since then no records from Britain appear to have been published, but after continued collection of material from the lakes and tarns in the English Lake District, I am able to extend the known British distribution by the record of the following localities where I have collected specimens :—

Sprinkling Tarn (Cumberland) in 1911 ; Windermere Lake (Westmorland) and a small tarn on Claife Heights (Lancashire) in 1912 ; Easedale Tarn (Westmorland), and again Highlow Tarn (Lancashire) in 1913.

In the gathering obtained from Easedale Tarn during May, 1913, and examined during November of that year, the living animal was obtained for the first time, I believe, in Britain ; though only one was discovered. In this individual the protoplasm showed the characteristic faintly bluish tinge, and contained numerous clear granules and rounded bodies (droplets ?), and a single pulsating vacuole. The nucleus was obscured by the large size of the chromatophores. Of these bodies the protoplasm enclosed two, lying across one another (fig. 2 chr.). They were of a bright bluish-green colour, similar to that of the blue-green algæ. Penard, in his account, describes the chromatophores as having all the characters of distinct organisms of the nature of cyanophyceæ, living apparently symbiotically with the rhizopod, but incapable of existence apart from it. They grow and divide, and thus the occasional occurrence of two chromatophores in one individual would be accounted for.

Chlorophyll bodies are also observed in some other rhizopods, e.g., species of *Amphitrema*, and they are here probably of a similar nature. In both these cases, solid food bodies are not observed in the protoplasm of the animal, and this absence would be explained by the supposed symbiosis. Much work, however, remains to be done on this interesting subject.*

* One might refer here to the observations on symbiosis by Professor Keeble, an account of which is given in his book on ' Plant-Animals.'

The animal was distinctly active, and progressed in an irregular jerky fashion by means of two long, rigid, threadlike pseudopodia, which were occasionally withdrawn suddenly in a zigzag fashion (fig. 1). Locomotion recalled that observed in species of *Euglypha*.

The test was 30 μ long and 23 μ broad.

It will be noticed that in all localities given above, the animals were living in clear water, as distinct from bog-water. It seems probable that more extended researches on the sediment of lakes and tarns would show that *Paulinella chromatophora* is much more widely distributed than our present knowledge suggests. Investigation on the sediments from our Scottish Lochs and Welsh Lakes is much to be desired.

LITERATURE.

1895. Lauterborn, R., 'Protozoenstudien,' in Zeitschr, f. wiss. Zool., Bd. 59.

1905*a*. Penard, E., 'Sur les Sarcodines du Loch Ness,' in P. R. Soc., Edin., XXV.

1905*b*. —— 'Notes sur quelques Sarcodines,' in Revue Suisse de Zool.

1910.—Brown, J. M., 'Freshwater Rhizopods from the English Lake District,' in Journ. Linn. Soc. Zool., XXX.

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The Journal of the Board of Agriculture, volume 21, part 11, contains an illustrated report on 'The Manufacture of Charcoal.'

In *The Journal of the Board of Agriculture* for March, Mr. B. B. Osmaston has an article on 'Larch Killed by Longicorn Beetle' (*Tetropium gabrieli* var. *crawshayi*).

An interesting paper on 'The Genesis of Geography,' by Miss Kate Qualtrough appears in *The Journal of the Manchester Geographical Society*, volume 30, parts 1 and 2, 1914, issued March 1915.

The Journal of the Derbyshire Archæological and Natural History Society, volume 37, is well filled and well produced as usual, under the careful editing of C. E. B. Bowles. The publication contains papers on 'Megalithic Remains,' 'Stone Circles,' 'Earthworks,' 'Derbyshire Place-names,' and other items of antiquarian interest. Messrs. Jourdain and Hayward contribute the 'Zoological Record 1914,' which deals particularly with birds and lepidoptera.

From Dr. R. W. Shufeldt we have received the *Blue-Bird*, an American publication, which contains an admirable illustration and description of what is described as 'The Last Passenger Pigeon (*Ectopistes migratorius*)'; and in *The Auk* Dr. Shufeldt gives an elaborate anatomical description of the same species, with illustrations. Dr. Shufeldt is certainly to be congratulated on the way with which he has preserved all available information relating to this species.

The Journal of the Northants Natural History Society and Field Club, volume 17, is quite up to the standard of this society's publications. There are notes on the natural history and archæology of the county, and Mr. Beeby Thompson contributes more of his interesting notes on 'Wells and Spas.' Among other subjects dealt with are fresh water shells, meteorology, valentines, embroidery, earthworks, etc. There are also some excellent reproductions of photographs.

A DIARY OF ORNITHOLOGICAL OBSERVATIONS IN BRITTANY.

EDMUND SELOUS.

(*Continued from page 141*).

JULY 8TH.—Some mornings ago I saw a pair of these birds about a certain briar-bush bordering the osier-bed that runs through a part of this valley, making the stream more a sop. This morning I saw one of them (as I suppose) fly from the same bush again, and, examining it, found indeed a nest of the right type, but an old one. This a curious thing. The situation of the nest—horribly guarded by the stems of brambles, between which it is wedged—is exactly in accordance with the entry of the bird into the bush, which is that in and about which a pair have been observed by me. If, therefore, this old nest is not theirs, it is a curious coincidence; but if it is, what is the meaning of their coming to it? Do they intend to lay in it again, having perhaps repaired it?—or to make another near by? It was certainly these birds and no others, for, on going to the bush, I heard their alarm, or irate note, in the neighbourhood.

JULY 9TH.—Have again this morning seen the two birds in the close neighbourhood of the old nest, but more about the bush next to the one it is in. It is the same this evening—from 6-35—and there can, I think, be no doubt, either that they have built or are building or intending to build there. I do not think it is the first, as I have not been able to make out any carrying of food, and the movements seem different, the two birds sometimes chasing each other. The second it may be, for one of them this morning came out upon the grass, and I judged—for I could not get the glasses on it in time to make sure—that it was pulling at a piece of it. This was probably the female. I looked for her to come down again in what seemed so favourable a spot, but she did not, nor had I before been able to put this interpretation on either of the bird's actions. If, however, the material for the nest is being collected mostly within the osier thicket, it would be impossible to see the birds. It is true that some days ago I saw a bird of this species with a moth in its bill (suggesting nursery cares), but this was in another part of the labyrinth, and I think it was another individual. Having long watched the little corner of bush, as it were, round which these two disappeared, into it, as it seemed to me, I at length examined it, but could find nothing. I have also made a sort of bower amongst the osiers, quite near where the nest, in my opinion, should be, and put down a bundle of bracken to sit on, the ground being not quite *terra firma*.

JULY 10TH.—The same pair of birds (as I make no doubt) still about the same place this morning—6-30 to 8—but have got no further to my knowledge.

JULY 11TH.—For about an hour before breakfast, I again watched the outskirts of the osier-beds, but without result. Coming again, after breakfast, I took up my position in the bed itself in the place I made yesterday, which just commands the spot which I still think must be the birds' nesting-place. I spread my cycling cape on the heap of bracken I had put down—which was now all a sop—put my satchel, which is my usual seat, on this, and sat and watched in silence. It was not long before I saw one of the birds, but though this was repeated, and the harsh rattling note sounded from time to time, I got no further indication. All then ceased for a considerable time, but at last I caught a glimpse of a small brown shadow passing across a leaf amidst the labyrinth into which I tried to penetrate. Then the same leaf, and another beyond it, twitched once or twice, the birds were their sure enough, but put my head to this side or that as I would, I could never quite see them. During an interval of quiescence, I walked quickly out, clipped an intervening osier spray or two, and took my seat again. Now there was another long interval, half-an-hour perhaps, during which I saw nothing, then the bird was there again, and flitted down into the bush. Once or twice again this happened, and each time a certain stem shook. Fixing my eyes on this stem, and getting it again when I lost it, which, in creeping out under the tangle, on my hands and knees, I could not avoid doing, I at length stood still, looking at it; then, walking up to it, a beautiful little nest hanging on a bramble bough, and beautifully concealed by its leaves, was before me. In it were three tiny young birds, naked and yellow. I put back the intervening foliage between the bush place and my observatory, and, exposing the nest in the same way, so as to cover it again when I left, took my seat and waited again with glasses adjusted on the seat of my camp-stool. In a very few moments a pretty little, sleek-looking, yellow-breasted Warbler, with long dagger beak—the best view I have yet had of it—flew to the nest, fed a young one, was off again, returned, fed another, and so once again, then brooded the young, making a sweet little picture. I was just concluding that I had been right in concluding that the young were fed only by the hen, when up flew the male, swiftly passed something to his mate as she sat, and in a moment was gone again. The hen had now a small green caterpillar in her bill, and she remained sitting thus with it till just before leaving the nest, when she ate it. She was back almost directly with a fly, which she gave to one of the young, and whilst standing over them, the male flew in again and gave her another fly, which I think she ate, and

then something larger—of goodly dimensions—what I cannot say, and this she fed the chicks with. She continued of her own efforts to feed and brood them at intervals, and every time whilst she brooded, the male flew in with a fly (except once when it was a caterpillar) in his bill, which he gave her. This she sometimes ate at once, but more often remained with it in her bill whilst she sat on the nest, and, on leaving it, carried if off with her. In a moment or two she would return with food for the nursery, but I have no doubt that she had first eaten what her husband had brought her, for once when this was a caterpillar, she flew off with it and returned with a fly.

And so this pretty little play went on. I do not think the male ever fed the young, except thus indirectly, but I am not sure. He certainly more than once dipped down his head into the nest, but I think it was to eat something in it, whether a fly or other winged thing that had been dropped there from his own or the female's bill, or an excrement in the orthodox manner, I am not sure. Several times something was picked thus out of the nest and eaten by both parents, but mostly the hen, and that these were for the most part, if not always, the droppings of the young birds, would be according to all analogy. But I could never quite make this out. They were apparently very much smaller than in the case of the Garden Warbler, but this might be in relation to the size of the young.

My observations were continued in the afternoon. The male does certainly, I think, sometimes feed the young because, on one occasion, the arriving bird came so close after the one that went—the female which had been brooding the young—and from the opposite direction to that in which she had flown, that it could hardly by any possiblility have been the same. This bird then, which must therefore have been the male, fed the young. This however, seems only to be occasional with him, his usual habit being to bring something to the female, which either gives it to the young, eats it herself, there and then, or sits with it in her bill till she flies off, carrying it with her, presumably to eat elsewhere. I have seen her do all three, but the first is the least frequent. When she feeds the young with what is brought to her in this way, she does not hop on to the rim of the nest and give it them from there, which is otherwise her usual method, but rises up in it, where she sits and bends down her head to them. This gives her a lean and lanky appearance, or rather it exaggerates it, for this, and a certain smoothness and glossiness of the plumage is more characteristic of this species than of our own Warblers. She shows, on these occasions, the feathered part of her legs, but not the naked shanks. The food thus brought in for the female, as she sits, is presented and taken by her in the tip of the bill, and held

thus all the time. The bill is a veritable dagger, so sharply and finely is it pointed, and, in proportion to the size of the bird, of some length. Once when the male came in with a good-sized green caterpillar, the voices of people passing through the valley (it being Sunday) startled him, and he flew away with it. As he did not bring it again on his return, presumably he ate it himself. All has gone on as before, the female making two or three visits, and feeding the chicks, in quick succession, then settling herself upon them with several little rufflings of her feathers, rising a little and re-settling herself, as with extreme satisfaction, before finally brooding. If the male comes with his offering, well and good, but she does not wait for him, but goes off when she has sat long enough herself, without food, or thinks the chicks want more. The whole thing is perhaps the prettiest picture of bird life that I have yet seen. It seems probable that, from relations like these, has grown that fixed division of labour as between the male and female, in the providing and subsequent disposal of the food, which we see in some of the birds of prey, e.g., the Peregrine, Merlin, and Sparrow Hawk, and which has become so tyrannical, that it seems probable the young would be left to starve in the nest sooner than an alteration of custom be made to meet some sudden contingency, such, for instance, as the death of either parent. Whether however, the habit of the male feeding the female on the nest has originated out of his feeding the young, or vice versa is not, perhaps, easy to settle, though the first seems the most probable.

This time I saw more clearly the process of cleaning the nest, which consists, with these birds, in the systematic swallowing of the excrements of the young. The female was the most assiduous in this, which is a necessary outcome of her being far more on the nest, but both parents are influenced by the same traditions.

The above observations were made from an efficient shelter at a greater distance from the nest than I had watched at, on former occasions, as there had lately been signs of the birds becoming shy, which might, perhaps, have ended in the male's ceasing to co-operate. I have now a perfect view (except for the gloom of their nesting retreat) at a quite safe distance as far as observation is concerned. I left at 7-10.

(*To be continued*).

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The Transactions of the Yorkshire Dialect Society, part 10, has recently been issued, and contains a paper on 'How we used to deal with Wife Beaters in Holderness.' Among the other items is a paper on 'Popular Speech and Standard English,' by L. P. Smith.

YORKSHIRE COLEOPTERA IN 1914.

W. J. FORDHAM, M.R.C.S., F.E.S.

THE following list of beetles includes the more noteworthy captures of 1914 and also several previous captures not already recorded. The amount of material provided by the members of the Yorkshire Coleoptera Committee was so large that it has been difficult to select the records for this list without making it unduly long. The lists of beetles taken during the excursions of the Yorkshire Naturalists' Union and already published in *The Naturalist* should be consulted. On the occasion of the Union's visit to Filey, Mr. E. C. Horrell took 182 species, including many very interesting new records and several varieties and aberrations. It is hoped that in future more attention will be paid to varieties and local forms. The dagger (†) as usual indicates a new county record and the asterisk (*) a new riding record. The initials indicate Dr. H. H. Corbett, Messrs. E. G. Bayford, J. W. Carter, E. C. Horrell, E. W. Morse, M. L. Thompson, W. E. Sharp, G. B. Walsh and the writer.

* *Notiophilus substriatus* Wat. Bubwith. W. J. F.

Acupalpus exiguus Dj. Thorne Moor, April, in a heap of cut rushes. H.H.C. A specimen nearer type than the var. *luridus* Dj. taken by Dr. Corbett in the same locality, 15-5-1903. (*Nat.*, 1908, p. 13).

* *Bradycellus cognatus* Gyll. Filey. E. C. H.

* *Ophonus brevicollis* Dj. Knottingley, 1898. W. J. F.

* *Harpalus rubripes* Duft. Filey. E. C. H. This was an example of the var. *sobrinus* Dj. with dark legs.

Pterostichus aethiops Pz. Ingleby Moor, Cleveland. A. A. Fordham.

minor Gyll. Bubwith, W. J. F. Raincliffe Wood. E. C. H.

Amara rufocincta Dj. and *similata* Gyll. Cotherston. G. B. W.

† *Laemostenus complanatus* Dj. Middlesbrough, 1912. A. A. Fordham.

Anchomenus gracilis Gyll. Bubwith and Skipwith. W. J. F.

Bembidium lampros Hbst. var. *velox* Er. Helmsley, 1912. G. B. W.

atrocæruleum Steph., *decorum* Pz. and *prasinum* Duft. Richmond, Aug., in numbers. G.B.W.

* *bruxellense* Wesm. Near Keighley. H. E. Johnson. (J. W. C.).

Patrobus excavatus Pk. Moors above Hipswell. G. B. W. A small dark form, probably that mentioned by Bold as being mistaken for *assimilis* Chd.

**Patrobus clavipes* Th. (=*assimilis* Chd.). Filey. E. C. H.
**Haliplus confinis* Steph. Bubwith, 1911. W. J. F.
* *fluviatilis* Aub. Hackness. E. C. H.
Hydroporus septentrionalis Gyll. Richmond, August. G.B.W.
Acilius fasciatus De G. Thorne, April. H. H. C.
†*Anacæna bipustulata* Steph. Thorne, April, numbers. H. H. C.
**Helochares punctatus* Shp. Skipwith Common. W. J. F.
Berosus luridus L. Thorne, April, abundant. H. H. C.
Helophorus arvernicus Muls. Richmond, August. G. B. W.
Henicocerus exsculptus Germ. Richmond. G. B. W. Settle. W. E. S.
†*Cercyon depressus* Steph. Filey, 1911. W. J. F.
**Oxypoda opaca* Gr. Bubwith. W. J. F.
**Ischnoglossa corticina* Er. Filey. E. C. H.
†*Ocyusa incrassata* Muls. Whitfield Gill, Askrigg, June. M. L. T. Moss. Kildale, July. M. L. T.
Phlœopora reptans Gr. Cusworth, April. H. H. C. and Prof. T. H. Beare.
**Callicerus obscurus* Gr. Filey. E. C. H.
†*Homalota insecta* Th. Filey. E. C. H.
* *aequata* Er. Doncaster. Abundant under bark and in old polypori. Spring. H. H. C. and T. H. B.
* *angustula* Gyll. Bubwith, 1911. W. J. F.
* *cuspidata* Er. Wheatley and Cusworth under bark, April. H. H. C.
eremita Rye. Kildale. June, sphagnum on high moor. M. L. T.
* *triangulum* Kr. Skipwith, 1913. W. J. F.
**Tachyusa flavitarsis* Sahl. Filey. E. C. H.
† *umbratica* Er. Redcar, 1913. W. J. F.
Gnypeta coerulea Sahl. Ingleton, June, some numbers. E. W. M.
Encephalus complicans West. Roundhay Park. Spring. Sparingly in moss on walls. E. W. M.
†*Gyrophæna laevipennis* Kr. Glaisdale, fungi, August. M. L. T.
**Epipeda plana* Gyll. Cusworth, abundant, April. H. H. C. T. H. B.
Sipalia ruficollis Er. Askrigg. M. L. T. Arncliffe Wood. M. L. T.
Myllaena elongata Mat. Leven Bridge, stream bank, July. M. L. T.
Hypocyptus laeviusculus Man. Arncliffe Wood. M. L. T. Roundhay Park in moss on walls sparingly, spring. E. W. M.
**Tachyporus pallidus* Shp. Thorne, April, fairly common. H. H. C.
brunneus, F. Filey. E. C. H. Bubwith. W. J. F.

Tachinus laticollis Gr. Raincliffe Woods and Stoney Haggs. E. C. H.
**Megacronus cingulatus* Man. Thorne, April, sweeping. H.H.C.
†*Heterothops dissimilis* Gr. Spurn, 1911. G. B. W. Middlesbrough in dunghill. M. L. T.
Quedius mesomelinus Marsh *var. *fageti* Th. Bubwith. W.J.F.
cruentus Ol. †var. *virens* Rott. Bubwith, 1913. W. J. F.
obliteratus Er. Heeley, Sheffield, 1906. W. J. F.
auricomus Kies. Whitfield Gill, June. M. L. T.
**Staphylinus pubescens* De G. Bubwith. W. J. F.
**Philonthus atratus* Gr. Skipwith Common. W. J. F.
* *cephalotes* Gr. Filey. E. C. H.
* *cruentatus* Gmel. Skipwith Common. W. J. F. Type and immaculate var.
†*Gabrius splendidulus* Gr. Wheatley Wood, under bark of felled trees, April, H. H. C. T. H. B.
**Gabrius nigritulus* Gr. Bubwith. W. J. F.
**Leptacinus parumpunctatus* Gyll. Marr, 2-8-1906. H. H. C.
* *formicetorum* Märk. Cusworth, 10-9-1911. H. H. C.
**Othius myrmecophilus* Kies. Filey. E. C. H.
Lathrobium longulum Gr. Escrick, 1911. W. S. F.
quadratum Pk. Bubwith, 1910. W. J. F.
**Cryptobium glaberrimum* Hbst. Ringingkeld Bog in wet sphagnum. E. C. H. (also Filey. E.C.H.).
**Stilicus orbiculatus* Pk. Filey. E. C. H. (Also Wheatley, 1903. H. H. C.).
Dianous cœrulescens Gyll. Shipley Glen, July, rather common. J. W. C.
**Stenus biguttatus*, L. Bubwith. W. J. F.
guynemeri Duv. Whitfield Gill. M. L. T.
latifrons Er. Stoney Haggs. E. C. H.
**Oxytelus inustus* Gr. Filey. E. C. H.
†*Haploderus cælatus* Gr. Thorne, 4-8-1907 and April 1914, H. H. C. Bubwith, 1910. W. J. F.
**Trogophloeus arcuatus* Steph. Bubwith. W. J. F.
**Lesteva punctata* Er. Arncliffe Wood and Kildale in sphagnum. M. L. T. (also Whitfield Gill, M. L. T.).
Acidota crenata F. Eston Nab., one shaken out of grass tuft, 27-4-1909. G. B. W.
Homalium punctipenne Th. Wheatley and Cusworth, April. H. H. C.
† *iopterum* Steph. Kildale, mountain ash, June. M. L. T.
**Megarthrus affinis* Müll. Filey. In nest of field mouse. E. C. H.
Phlœobium clypeatum Müll. Filey. E. C. H. Thorne. April. H. H. C.

* *Phlœocharis subtilissima* Man. Filey. E. C. H.
**Leptinus testaceus* Mull. Filey, in nest of field mouse. E. C. H. (also Raincliffe Wood, moles' nest (leg. R. A. Taylor). E. C. H.).
†*Silpha sinuata*, F. Wheatley, July, 1904. H. H. C. Escrick 1912. W. J. F.
**Choleva agilis* Ill. Bubwith. W. J. F.
* *morio* F. Whitfield Gill, moss, June. M. L. T.
* *grandicollis* Er. Bubwith. W. J. F.
* *fumata* Spence. Bubwith. W. J. F. (It is very probable that the occurrence of this species in Yorks. (Ste. Ill. and Man.) being communicated by Spence would be in Hull neighbourhood).
†*Catops sericatus* Chaud. Escrick, 1911. W. J. F.
**Neuraphes elongatulus* Müll. Roundhay Park, sparingly in moss on walls, spring. E. W. M. (also Kildale, moss, June. M. L. T.).
Scydmænus scutellaris Müll. Great Ayton, moss, August. M. L. T. Seamer Moor. E. C. H. Filey. E. C. H.
Scydmænus exilis Er. Adel. A few under fir bark, February. E. W. M.
Trichopteryx grandicollis Man. Raincliff Wood. E. C. H.
Ptenidium intermedium Wank. Leven Bridge, May, flood refuse on banks of stream. M. L. T.
†*Scymnus testaceus* Thunb. var. Filey. E. C. H. (Of this specimen Mr. E. W. Sharp, F.E.S., says 'possibly *S. lividus* Bald.').
Hister unicolor L. Bubwith. W. J. F.
* *carbonarius* Ill. Bubwith. W. J. F.
**Micropeplus staphylinoides* Marsh. Filey, in nest of field mouse. E. C. H.
* *margaritæ* Duv. Filey, in nest of field mouse. E. C. H.
**Cercus bipustulatus* Pk. Filey. E. C. H.
Epurœa melina Er. Filey, in nest of field mouse. E. C. H. Bubwith. W. J. F.
florea Er. Glaisdale, mountain ash, August. M.L.T
**Micrurula melanocephala* Marsh. Filey. E. C. H.
Nitidula rufipes L. Hawksworth, 1913. T. Stringer. (J.W.C.).

(*To be continued*).

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The *Report of the Manchester Museum* (publication 76) is considerably curtailed owing to the grant from the Council of the University being reduced from £1,200 to £200 on account of the war. It contains the refreshing piece of information, however, that during the year the museum has spent the £1,000 which had been given by the University for the purchase of new cases.

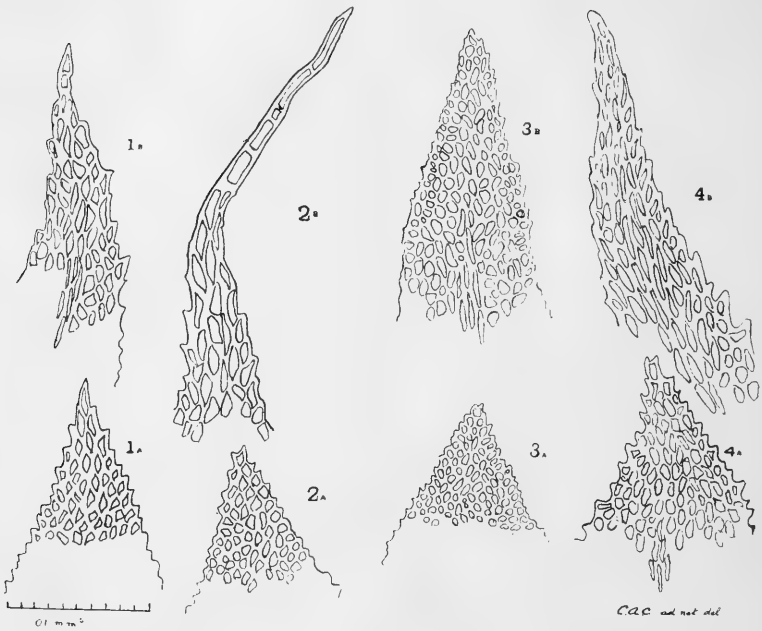
BRYOLOGISTS AT AUSTWICK.

CHRIS. A. CHEETHAM.

OWING to the early date of Easter the first meeting of the Yorkshire Naturalists' Union this season was postponed, and the Bryological section took advantage of this and visited Austwick.

The lessened railway facilities reduced the attendance somewhat.

On the first evening specimens and diagrams of the Thuidia, which have been recently revised by Mr. H. N. Dixon, F.L.S.,



1. *Thuidium tamariscinum.* 2. *T. Philiberti.* 3. *T. delicatulum.* 4. *T. recognitum*
A. Apex of branch leaf. B. Apex of stem leaf.

in *The Journal of Botany* this year (pp. 189-192) were exhibited and the differences pointed out. A working key based on that given by Mr. Dixon was used, but it must be here emphasised that the following remarks are based on the plants as seen in this district :—

1	Branch leaf with pointed apical cell	=	*T. tamariscinum.*
	,, ,, ,, truncate and pappilose apical cell	=	2
2	Stem leaf with filiform point of single cells ..	=	*T. Philiberti.*
	,, ,, without ,, ,, ,, ..	=	3
3	Stem leaf with apparently ex-current nerve the cells in apex much elongate	=	*T. recognitum.*
	Stem leaf with nerve ceasing below apex which is of short cells	=	*T. delicatulum.*

It was shown that the pointed apical cell clearly differentiates *T. tamariscinum* under the microscope, and also that its tripinnate branching was a good field character being only very occasionally acquired by *T. Philiberti* in its variety *pseudo-tamarisci*, and in this case, as also in typical *Philiberti*, it is quite easy to see the filiform point of the stem leaves with a pocket lens.

Under the microscope *T. recognitum* is a much coarser plant than *T. delicatulum*, the cells and pappillæ being considerably more elongate, the apical cell of the branch leaf of *T. delicatulum* is generally as long as broad, whereas of *T. recognitum* is almost twice as long as broad. The stem leaves are usually quite distinct, though, until one has seen *T. recognitum* it is possible to imagine that an elongation is occasionally noticable in *T. delicatulum*; this, however, is never of the distinct type found in *T. recognitum* where the shorter cells of the lamina seem to finish somewhat abruptly at the base of the apex. Again, the stem leaf margin of *T. recognitum* is generally plane or very slightly recurved, whereas that of *T. delicatulum* is strongly recurved.

In the field the difference between the two in the extreme types is fairly satisfactory, the general impression that is gained is that *delicatulum* is in somewhat swollen tufts, the ends of the stems being curved down and a certain neatness thus acquired, the tufts also are mostly quite pure; on the other hand *T. recognitum* is generally much mixed with *H. molluscum*, etc., and has a straggling habit. Another small point is that the branches of *T. recognitum* have an attenuate appearance, the central axis of the branch being considerably lengthened out.

The general facies of *T. delicatulum* and *T. recognitum*, as seen near Austwick, is quite at variance with Limpricht's description of the continental specimens, so it is necessary to reiterate the fact that these remarks apply to the local plants.

Mr. Dixon, in drawing attention to these plants, pointed out that true *T. recognitum* appears to be distinctly rare in Britain, occurring in older herbaria from Matlock and Ingleton, whereas most of the modern gatherings are misnamed and belong chiefly to *Philiberti*; this is certainly the case with previous Yorkshire records, which must be revised. *T. Philiberti* will now become a fairly well-distributed Yorkshire species, it was first recognised as such in 1911, where it is reported in *The Naturalist* on page 232.

The only member of the series seen in fruit was *T. tamariscinum* although careful search was made seeing that the fruiting characters of the fertile plant are valuable for classification.

T. Philiberti was always found in dry places, on walls, limestone screes, etc.; *T. recognitum* and *delicatulum* on

limestone rocks in shade; *T. tamariscinum* frequent in all situations.

The first excursion was via Trow Gill and across to the head of Crummockdale. Some nice *Seligeria recurvata* (*S. setacea*) was the first prize, then came the above mentioned Thuidia and an addition to the Lune drainage in *Amblystegium confervoides* which Mr. R. Barnes showed to belong to West Yorks. on page 129 of this volume; *Zygodon gracilis* (*Z. Nowellii*) was also seen in fair quantity; *Antitrichia curtipendula* and *Polytrichum strictum* on the open ground in crossing over, and also *Pleuridium subulatum*, this latter being very frequent all over the district.

In Crummockdale *Hypnum falcatum* var. *virescens* (*Amblystegium falcatum* var. *fluctuans*), *Grimmia Doniana*, *Acaulon muticum* (*Sphærangium*) and *Cynodontium Bruntoni* were the first to claim attention, and later *Andreæa petrophila*, and *crassinervia*, *Bryum alpinum* and *Hedwigia ciliata* (*H. albicans*).

The next excursion was to Helwith Moss. *Leucodon sciuroides* was seen in abundance, and a little *Pterogonium gracile* (*P. ornithopodioides*), this being found later in fair quantity. On the Moss some fine *Hypnum giganteum* (*Amblystegium*) and fruiting *Mnium subglobosum* (*M. pseudopunctatum*), the last named new to Ribble drainage; on the rocks above, *Grimmia funalis* and *subsquarrosa*.

Monday gave us a glorious day and Moughton Scar was visited, the *Saxifraga oppositifolia* in grand flower being highly appreciated. Of mosses, *Hylocomium rugosum* (*Hypnum*), *Cylindrothecium concinnum* (*Entodon orthocarpus*), and *Thuidium Philiberti* were the best. Down the other side of the hill the *Andreæas*, *Bryum alpinum* and *Campylopus atro-virens* were again seen. Additional species were *Hypnum sarmentosum* (*Amblystegium*), *Diphyscium foliosum* (*Webera sessilis*), *Fissidens osmundoides* and *Funaria ericetorum*.

Other trips were to Oxenber Woods to see the Thuidia again, and here we got fruiting *Fissidens decipiens*, and to Feizor, where *Funaria calcarea* was gathered.

The days passed far too quickly, and the lively discussions with the help of microscopes in the evenings often made the lamps burn midnight oil.

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Some Geographical Factors in the Great War contains 71 pages (price 9d. net, A. Brown & Sons, Ltd., Hull). In this little book **Mr. T. Herdman** describes some general considerations. Geography contains the great dramas of history. Great campaigns have been lost or won, attempts at colonizations have failed or succeeded, political arrangements have been fleeting or permanent according to the appreciation of geographical conditions shown by the leaders responsible for them. All this is shown in the volume, which is illustrated by a number of maps.

YORKSHIRE NATURALISTS' UNION: VERTEBRATE SECTION.

A MEETING of this section was held in the Leeds Institute on February 20th; Mr. E. W. Wade, M.B.O.U. in the Chair. Mr. Bagshaw urged the advisability of keeping in touch with the West Riding County Council with reference to its list of birds issued under the Wild Birds' Protection Acts. He found that little had been done for several years, but he was of the opinion that a deputation from the Union would be effective in removing many of the present anomalies, or, suggestions might be sent in writing for the Sub-Committee's consideration.

Mr. Bagshaw's idea was to have three Schedules, viz. :— (1) Comprising the birds now omitted from the list. (2) Birds coming under the heading of game. (3) Injurious birds—such only to be shot, caught or destroyed by the owner or occupier.

Mr. W. H. St. Quintin reported that the Departmental Committee of the Home Office had not yet concluded its sittings devoted to the survey of all the various lists in operation, and the evolution of a uniform schedule applicable to the whole country. Owing to the war, however, there seemed little likelihood of anything being done at present.

Mr. Fortune's experience, when he interviewed the Committee at Wakefield, was the absence of any difficulty in adding birds to the list, and the utter impossibility of deleting a single species. Discussion was deferred until the November meeting.

Mr. H. B. Booth drew attention to the fact that the Heron's five years' full protection would lapse this year.

Mr. Booth, on behalf of Mr. Wilkinson, reported the decision of the Wild Birds' Committee on the appointment of watchers for 1915.

The President referred to the death of the Rev. F. H. Woods, of Bainton, a well-known figure at the Union's excursions.

Mr. Wade handed round a copy of the revised nomenclature of British Birds issued by the British Ornithological Union, and exhibited many interesting specimens from St. Kilda.

In connection with the so-called Little Bunting shewn at the November Meeting, Mr. H. B. Booth shewed skins of the proper species as well as of the Blackheaded Bunting.

Mr. Wade expressed the appreciation of the Section to Mr. St. Quintin for the erection of bird-rests on Spurn lighthouse, Mr. St. Quintin having borne the whole expense. Unfortunately owing to the unusual conditions prevailing on the East Coast, no opportunity had been afforded of estimating the beneficial results to our migrant birds, but reports from other lighthouses where similar structures were installed demonstrated their efficacy in a marked manner.

The Royal Society for the Protection of Birds, with the

co-operation of the authorities of the Trinity House, whose Engineer had given his personal help and interest, had been responsible for the erection of three other stations in addition to the above, i.e., at St. Catherine's, I.-of-W., the Caskets off Alderney, and South Bishop off Pembrokeshire; and had further work in view.

Mr. H. B. Booth then gave a very interesting and detailed paper, 'The Bats of Upper Airedale and Upper Wharfedale,' dealing with their distribution and status in part of the district under investigation by the Bradford Natural History and Microscopical Society.

The President (Mr. E. W. Wade) gave a lantern lecture entitled, 'Birds of St. Kilda,' dealing very fully with the topography and natural history of this well known bird resort. The lecturer had paid particular attention to the St. Kilda Wren, and in contradiction to Howard Saunder's assumption in 1889 that 'the few pairs had probably been extirpated,' it was gratifying to note its comparative ubiquity in 1914. The price of 20s. for a clutch of eggs in 1889 had, no doubt, resulted in a serious reduction in the numbers of this Wren, but after the demands of the wealthy but indiscreet collectors had been met, the price fell to such a figure as to offer no inducement to the natives to continue the supply.

The Tree Sparrow, Rock Pipit, Wheatear, Starling, Eider Duck, Oyster Catcher, Guillemot, Razor-bill and Kittiwake were all noted as being very common, but even these species were insignificant when compared with the countless thousands of the Gannet, the Puffin and the Fulmar Petrel. In spite of the enormous numbers taken every year for food, these three birds dominate the Islands and have apparently driven off the Gulls.

The paper was enhanced by the exhibition of skins of the Wren, the Fulmar, Leach's Petrel, the St. Kilda Vole, etc.

Mr. Booth drew attention to the similarity of the native Wren to that resident in the Scillies, which shewed variations in size and colour, on much the same scale.

In the absence of Mr. G. A. Booth, his paper 'Notes on the Ruff and Reeve,' was read by Mr. Fortune, accompanied by the exhibition of many beautiful lantern slides of the birds taken in their Dutch habitat.

The antics of the male birds at breeding time, which are so marked and problematical, were fully described, and the many beautiful variations of plumage were well depicted by the photographs, as well as the actions and demeanour of the Reeve when approaching and occupying the nest.

The concluding paper was by Professor W. Garstang on 'The Development of Flat Fishes.' At former meetings we have had evidence of Professor Garstang's work on the Fisheries Com-

mission, and the present paper was in no way behind, either in interest or scientific value. Diagrams were shewn illustrating the evolution of the different types comprising the Sole, Plaice, Flounder, Halibut, in one group of 'left side' species, and the Brill and Turbot which 'turn' in a reverse manner.

The many complicated changes of the anatomy of each species, from the normally shaped young to the fully developed fish, were explained with care and thoroughness not usually associated with 'fishy stories.' *

A. Haigh-Lumby.

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Highways and Byways in Lincolnshire. By **W. F. Rawnsley.** London: Macmillan & Co., 519 pages. Stamford, Grantham, Lincoln, Isle of Axholme, Grimsby, Caistor, Louth, Boston, Spalding, Croyland and many other charming spots in our second largest county are described in this very interesting book by Mr. Rawnsley, and the value of the volume

Surfleet Windmill.

is enhanced by the numerous excellent sketches made by F. L. Griggs. In addition to the notes on ancient and modern Lincolnshire the author has gathered together much useful information relating to the Black Death, Fenland, Old Lincolnshire Families, Folk Song, etc. This book is a most useful one and will do much to draw attention to the beauties of a county usually neglected by the student and tourist.

* In the report of the last meeting of this section it should have been stated that, on Oct. 7th last, Mr. H. Wrigley, of Ganton Hall, and party shot 29 brace of Red-legged Partridge in a total bag of over 150 brace, comprising both species (see *The Naturalist*, Feb., page 82). On the same page, for Daubenton's Bat read Whiskered Bat.—A.H.L.

BRYOLOGY OF CASTLE HOWARD.

WM. INGHAM, B.A.,
York.

THE 20th February, 1915, was a glorious spring-like day for the Excursion of the Yorkshire Bryological Committee, a great contrast to the wet days that preceded it.

We first examined the quarry close by the station. The dominant mosses here were three, all of the genus *Hylocomium*, viz., *H. splendens*, *H. squarrosum*, and *H. triquetrum*. A sub-dominant was *Brachythecium purum*, the fisherman's moss, as he uses it for scouring his worms. On the sides of the grassy hillocks was *Thuidium Philiberti*. On loose stones at the side of the quarry were the minute moss *Seligeria doniana*, and the glossy moss *Plagiothecium depressum*. On the cart-track leading into this quarry was *Barbula Hornschuchiana* in flat patches with adust complexion. The *B. purum* (a rare fruiter) fruits well here.

Proceeding along Crambe Beck we found the great rariety *Weisia calcarea* var. *viridula* lining the face and sides of a small depression on a bank. Here also was *Fissidens incurvus* mixed with *F. taxifolius*. We next took a long walk to the Castle Howard Quarry. Many small estuarine sandstones are scattered over the floor of the quarry, and the surfaces of these stones are kept sufficiently moist by shade, and by the dripping of water from the grasses, to support a rare moss in abundant fruit. This is *Brachyodus trichodes*. The writer has a specimen of this moss from the highest land in Britain, the summit of Ben Nevis, but mostly barren. This species was also found on the vertical face of a rock *in situ*, in shade, and therefore damp. *Polytrichum urnigerum* and *Dicranum Bonjeani* var. *calcareum* were also found here.

We found our way thence, guided by Mr. Mennell, to a small and interesting sandstone quarry. We were pleased to find here a repetition of the moss *Weisia calcarea* var. *viridula*. The dark green colour of this variety is evidently due to the influence of the sandstone habitat, as the pale green typical plant grows directly on the limestone.

This quarry produced the rare plants *Ditrichum tortile* and *Dicranella crispa*, both in fruit. We had clearly found here the happy hunting ground of Dr. Spruce and Mr. M. B. Slater. On the face of the crumbling sandstone was *Barbula vinealis* of a more vivid green colour than the writer has ever seen in this moss. On a very old wall with the ferns *Asplenium adiantum-nigrum* and *A. ruta-muraria* var. *elatum* Lange, was *Bryum caespiticium* near var. *imbricatum*, with pure white peristomes to capsules, the white almost vanishing on drying.

FLOWERING PLANTS.

***Gagea fascicularis* Salisb. (*lutea* L.) as a Garden Weed.**—I recently visited a nursery garden in Doncaster, in order to see a 'troublesome yellow flowered weed' that was there. I was surprised to find the 'weed' to be *G. fascicularis*. The plants were literally in thousands, growing among Scillas, Tulips, Narcissi, etc., and the proprietor told me that they appeared about five years ago, and that he could not get rid of them. It seems remarkable that this pretty and rare plant of the open woodlands should become a pest. —H. H. CORBETT.

MOSSES.

***Seligeria recurvata* B. & S. in Cumberland.**—In July, 1910, I found this moss growing on rocks on the Cumberland side of the River Irthing near Gilsland. It was in abundant fruit. This is, I believe, the first record of any species of Seligeria from this county. My gathering was kindly verified by Mr. Ingham.—JAS. MURRAY, Carlisle.

***Lepidozia sylvatica* Evans, a new Yorkshire Hepatic.**—For some time this has been known as a North American species, and has also been recorded by Douin from the Continent. In the *Journal of Botany* for March, 1915, is a description of the plant with an announcement of its discovery in Sussex by Mr. W. E. Nicholson. On August 16th, 1904, January 4th, 1905 and April 25th, 1905, I found a Lepidozia growing directly on sand with a beautiful green form of the Hepatic *Sphenolobus minutus*. This was in a small wood by the side of Strensall Common in North-East Yorkshire. On receiving the description in the *Journal of Botany*, I re-examined my gathering and made it *Lepidozia sylvatica*. I sent a specimen to Mr. Nicholson who agrees. As Mr. Nicholson says, *L. setacea* is a plant of Sphagnum bogs, *L. trichoclados* of pure peat, and *L. sylvatica* of sandy ground or rocks. Students of Hepatics should re-examine their Lepidozias, noting the habitat of each.—Wm. INGHAM, York, April 10th, 1915.

HYMENOPTERA.

***Stenichneumon pictus* in Yorkshire.**—On January 2nd, 1915, Mr. S. Margerison found hibernating under the bark of a partly decayed pine in the Sawley High Moor Plantation, the ichneumon, *Stenichneumon pictus* Grav. Mr. Claude Morley, to whom the specimen was submitted, says that it is a distinctly uncommon species, and that he was unaware that it hibernated as an imago. According to Vol. I. of 'British Ichneumons,' Stephens found an example near London in June, and another is mentioned as being in Mr. Chitty's collection taken in September, at Ilfracombe. Specimens, however, have been bred several times from *Macaria liturata* and *Thera juniperata*.—R. BUTTERFIELD, Keighley.

In Memoriam.

THE hand of Death has recently reduced the ranks of Yorkshire naturalists in a way which is surely unprecedented. For some time we have, month by month, recorded the loss of prominent workers. We have now to deplore the departure from our midst of the following, who were connected with the Yorkshire Naturalists' Union :—

THOMAS BUNKER.

The death of Thomas Bunker at the age of 85 removes from

our midst one of the last of the naturalists of the old type. Years ago he was a familiar figure at the field meetings of the Yorkshire Naturalists' Union, and was not ashamed of his large butterfly-net and his vasculum. He was equally interested in bird, plant or insect, and was ever ready to impart his knowledge to anyone interested ; many Yorkshire naturalists to-day will remember with pleasure the interest shewn in their work and the encouragement given by Mr. Bunker.

A native of Bedfordshire, he first went to Goole as head-master of the National schools ; he then had a private school ; later he was a collector of taxes, but retired about twenty-five

years ago. He was of a retiring disposition, but in a quiet way greatly assisted the various Committees of the Yorkshire Naturalists' Union in their work. He has also made many important additions to the fauna and flora of the Goole district.

He had much to do with the founding of the Goole Scientific Society, about 1875, and in 1876 was the assistant secretary, his colleague being the late Dr. H. F. Parsons. Later, he was a president of the Goole Society. He frequently contributed to *The Naturalist*, and the 'Transactions of the Yorkshire Naturalists' Union' contain many of his records. Perhaps his best paper, and one which more than any showed his extensive knowledge of natural history, was printed in the first part of the 'Transactions of the Hull Scientific and Field Naturalists' Club,' in 1898. It was entitled, 'The Natural History of Goole Moor.'

In recognition of his services to natural history, the Yorkshire Naturalists' Union at a recent meeting elected him an Honorary Life Member. The pity is he has not long enjoyed the honour. We feel sure our readers join us in expressing our sympathy with Mrs. Bunker and the family.

WILLIAM SIMPSON, F.G.S.

William Simpson died at Catterall Hall, near Settle, at the age of 56 years. He was managing director of the firm of Simpson and Sons, Ltd., cabinet-makers and upholsterers, of Halifax and Blackburn. Prior to 1903 he resided at Halifax, and was widely known in business circles. His hobby was geology, and he devoted special attention to the Millstone Grit. Papers by him were printed in the 'Reports of the British Association,' in the 'Proceedings of the Yorkshire Geological Society,' 'The Halifax Naturalist,' and *The Naturalist*. He rendered good service in connection with the Halifax Scientific Society, and was one of the founders of the Halifax Sunday Lecture Society. For some years he was the Honorary Treasurer of the Yorkshire Geological Society.

HARRY SPEIGHT.

Harry Speight, the well known writer on Yorkshire History and Antiquities, died recently at his residence, Bingley, being a victim of influenza. He was born at Bradford 59 years ago. So long ago as 1877 be began writing sketches for magazines. His earlier books were written under the pen name of 'Johnnie Gray' and included 'A Tourist's View of Ireland,' and 'Pleasant Walks Around Bradford.' Then followed in 1891 the first of a series of books which made him known far and wide amongst Yorkshire folk, viz. :—'Through Airedale, from Goole to Malham.' The works which followed were on a more ample scale and are held in high repute. They include 'The

Craven and North-West Yorkshire Highlands," ' Nidderdale and the Garden of the Nidd,' ' Romantic Richmondshire,' ' Upper Wharfedale,' and ' Lower Wharfedale.' In 1898 he published his 'History of Bingley,' and among other publications of a similar nature were his ' Two Thousand Years of Tadcaster History,' and ' Kirby Overblow and District.' In his more active days he was a great pedestrian and he tramped over almost every portion of the British Isles and ascended most of the home mountains. He was an occasional contributor to *The Naturalist.*

JOSHUA ROWNTREE.

Joshua Rowntree, J.P., ex-M.P. for Scarborough, and a prominent member of the Society of Friends, died recently at the residence of his sister, Mrs. J. E. Ellis, Wrea Head, Scalby, near Scarborough, in his 71st year. Mr. Rowntree had been in failing health for some time.

Mr. Rowntree had been Mayor of Scarborough and was well known for his practical sympathies with any scheme for the betterment of mankind. He took a keen interest in the various Yorkshire scientific societies.

THOMAS WHITHAM.

Until quite recently a familiar figure at the excursions of the Yorkshire Naturalists' Union was that of Thomas Whitham, of Bramhope. He was tall and his high and wide-brimmed silk hat gave him quite a picturesque appearance. He was an artist of some ability, and frequently amazed his friends by the rapidity with which he could transfer to canvas his impressions of a landscape. He frequently exhibited at the local art exhibitions. He took a delight in the discussions held during the field excursions. Those who saw him tramp miles over hill and vale will be surprised to learn that he died at the advanced age of ninety-five, being Wharfedale's oldest inhabitant.

EDWARD PEACOCK, J.P., F.S.A.

Edward Peacock, well-known as a historian and antiquary, and the father of a talented family, died on March 31st at Kirton-in-Lindsey. He was born at Hemsworth, Yorkshire, in 1831. He was a frequent contributor to various literary and scientific journals.

He was editor of ' Army Lists of Roundheads and Cavaliers ' (1863), ' English Church Furniture, Ornaments and Decorations ' (1866), ' Instructions for Parish Priests ' (1868), ' A List of Roman Catholics in the County of York in 1604 ' (1872), ' A Glossary of Words used in the Wapentakes of Manley and Corringham, Lincolnshire ' (1877, second edition 1889),' Index

of English Speaking Students who have graduated at Leyden University' (1883), 'The Monckton Papers' (1885), 'Index to Engravings in the Proceedings of the Society of Antiquaries' (1885). In 1873 he published 'France, the Empire and Civilisation,' without the author's name. Further, among other essays, he contributed eleven papers to the *Archæologia* of the Society of Antiquaries, and many articles to *The Proceedings* of the same Society. He also wrote several romances, 'Ralf Skirlaugh,' 'Mabel Heron,' 'John Markenfield,' 'Narcissa Brendon,' and 'Otherwhere.' He was also a careful collector of antiquities.—T. S.

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The principal article in *British Birds* for April deals with the Blakeney Point Ternery, and is well illustrated.

In *The Lancashire and Cheshire Naturalist* for March, Dr. Jackson writes on 'Lancashire and Cheshire Arachnids and Myriopods.'

The Quarry for April contains an illustrated article on 'Excavating by Power,' in which Lincolnshire and Yorkshire quarries are represented.

The Scottish Naturalist for April contains a paper by the Hon. Sir Herbert Maxwell on 'Waterfowl and the American Pondweed (*Elodea Canadensis*).'

The Irish Naturalist records the death of what is probably the last Irish golden eagle. In the same journal Dr. R. F. Scharff has a paper on the Irish Names of Mammals, though we fear few English readers will be able to make much of the names as printed.

Wild Life for April contains a well illustrated article on Stone Curlew, written by Wm. Farren; Frances Pitt describes The Martin; Mr. Bootham has a note on The Buff-backed Heron; and Mr. F. J. Stubbs writes on The Plague Flea. The publication has the usual fine illustrations.

The Entomologist's Monthly Magazine for April contains a note on 'An Anthomyid Fly, *Phaonia* (*Hyetodesia*) *trimaculata* Bouche, New to the British List,' the species being from Cheshire. Records of Cumberland Hemiptera-Heteroptera, and Cheshire Diptera in 1913-14, also appear.

The Glasgow Naturalist recently issued, edited by D. A. Boyd and J. Paterson, contains a record of the work of the Glasgow Natural History Society. Among the papers we notice 'West Highland Mosses,' 'Glasgow Leeches,' 'The Trees of Kilkerran,' 'Clyde Micro-fungi,' 'Clyde Marine Fauna,' 'Clyde Birds,' and 'London Trees.'

In *The Entomologist's Monthly Magazine* for March, Mr. F. B. Brown writes 'With regard to the specific identity of *H. apicalis* Thoms., and *H. striatus* Shp., I am in the same position as my critic Dr. Sharp, in that neither of us has seen Thomson's types, but, curiously enough, the very words which Dr. Sharp quotes from Thomson's description, and which do not agree with any *Haliplus* known to Dr. Sharp, are just the words which first caused me to suspect the specific identity of *striatus* and *apicalis*.'

The *Geological Magazine* for April contains an unusually large proportion of papers of particular interest to our readers. Dr. C. W. Andrews describes a wonderfully perfect skeleton of *Ophthalmosaurus icenicus* from the Oxford Clay near Peterborough; Professor J. W. Gregory describes 'A Deep Bore at Seascale in Cumberland;' Mr. A. E. Trueman writes on the 'Fauna of Hydraulic Limestones in South Notts.;' Mr. A. Bell describes 'The Fossiliferous Deposits of Wexford and North Manxland,' and the Rev. Canon Crewdson has a paper on 'The Coniston Grits of Windermere.'

NORTHERN NEWS.

Dr. J. Scott Keltie, who is 75 years of age, is resigning the post of Secretary of the Royal Geolographical Society, which he has held for twenty-three years. He is succeeded by Mr. A. R. Hicks.

We regret to notice the death of Mr. W. M. Dobie at the age of eighty-six. With Charles Kingsley he founded the Chester Society of Natural Science, Literature, and Art, and for two years was its President.

The new Burton-on-Trent Public Museum and Art Gallery was recently opened by the Mayor, the collections being arranged in the upper story of the Old Police Station. It is the intention to keep the museum strictly local in its scope.

We regret to record the death of John Shillito, J.P., F.R.G.S., of Halifax, at the age of 83. He was a member of the Yorkshire Naturalists' Union since 1890, and a member of the Halifax Scientific Society. He was interested in land and fresh-water mollusca.

Messrs. Hutchinson & Co., are issuing a magnificently illustrated work entitled *Belgium the Glorious*, in fortnightly parts at 7d. each. It contains reproductions of art treasures of that delightful country as they appeared before the war. The part before us includes over 80 illustrations.

Richard Lydekker, of the British Museum, and the author of an enormous number of popular and technical natural history works, has just died, at the age of 66. His best work had reference to the Mammalia, living and extinct. Few journals of any standing had not printed articles from his pen.

From the Board of Agriculture we have received the *Annual Report of the Horticulture Branch, proceedings under the Destructive Insects and Pest Acts*, 1877 and 1907, and with the Board of Agriculture Act, 1889 (Section 2, Sub-Section 3) for the year 1913-14. It contains 79 pages, and is sold at the low price of 4½d.

A heron shot near Hedon on February 13th had on its leg Aberdeen University ring No. 35764. This we understand was ringed in the nest by Mr. S. H. Smith at York, on May 3rd, 1913. Mr. Smith also informs us that a Lesser Tern which was ringed at Spurn last July was shot at Oporto, Portugal, in September.

We take the following from the current number of *The Museums Journal* and make no comment. 'He was a striking example of that combination of powerful intellect with a child-like, lovable nature and delight in the beautiful, which we have always been accustomed to look for in its full development in Germany.'

We notice that Mr. A. R. Horwood was recently lecturing to the Leicester Literary and Philosophical Society on 'Plant Life in the Past.' We were surprised to learn from the circular however that *Fiends* were *particularly invited* (the italics are not ours). It was evidently expected that Mr. Horwood was going to give them a devil of a time.

We see from the *Hull Daily News* that a certain local geologist recently delivered a lecture on 'The Lost Towns of the Yorkshire Coast,' and that a discussion followed in which several local naturalists took part; which seems fairly matter of fact. The newspaper reporter evidently was so impressed by the harmonious nature of the proceedings that he headed the report 'Geological Society Concert.'

Judging from the columns of the daily press, the war is having some effect on the names given to new arrivals of *Homo sapiens*. It is not often, however, that anything of this kind influences scientific nomenclature. In a recent number of the 'Annals and Magazine of Natural History,' we find the following three new names for Bats, in a paper by Mr. Oldfield Thomas :—*Nyctalus joffrei, Pipistrellus kitcheneri*, and *Pipistrellus sturdeei*.

Some Geographical Factors in the Great War

By T. HERDMAN, M.Sc., F.G.S.

(Lecturer in Geography, Municipal Training College, Hull).

72 pages, crown 8vo, with 6 Maps, sewn in stout printed cover, 9d. net, post free 10d. net.

A feature of vast importance in the titanic struggle now taking place is the geographical condition of the various countries. In "Some Geographical Factors" the author provides much interesting information which helps his readers to a wider understanding of an important aspect of the present campaign. The concluding chapter on "The Problems of Nationality" affords a glimpse of the immense difficulties that face those statesmen to whose heads and hands will be committed the adjustment of the new boundaries.

The "Literary World" says:—"Those who would follow intelligently the movements in this world contest will find much help in this little handbook. Mr. Herdman's exposition of the part played in the war by the great land-gates and the seas is clear and informing, and is followed by some sound reasoning on the commercial war and the problems of nationality."

YORKSHIRE

BY

PEN AND PICTURE

EDITED BY

T. SHEPPARD, F.G.S., F.S.A.(SCOT.),

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1/- net, or post free 1/3 net.

This book, which might be almost described as a picture gallery of the County of Broad Acres, contains a great deal of useful and entertaining matter relative to every aspect of popular interest.

The Yorkshire Post says: "Mr. Sheppard is well known as a writer on antiquarian subjects, and this volume reflects his acquaintance with Yorkshire."

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THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, F.G.S., F.R.G.S., F.S.A.Scot.,
THE MUSEUMS, HULL;
AND
T. W. WOODHEAD, Ph.D., F.L.S.,
TECHNICAL COLLEGE, HUDDERSFIELD.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
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NOTES AND COMMENTS.

HONORARY DEGREES FOR YORKSHIRE NATURALISTS.

It must be very gratifying to the Yorkshire Naturalists' Union to find that its work has been so greatly recognised by the Leeds University. From the *Yorkshire Observer* for May 20th we learn that at the Court of the Leeds University held on May 19th, the Pro-Chancellor announced that the committee concerned had decided to confer honorary degrees upon the following gentlemen :—D.Lit.—The Rev. Charles Hargrove, M.A., and Mr. Philip Wicksteed, of Leeds. LL.D.—Dr. D. Forsyth, M.A., D.Sc., head master of the Leeds Central High School, who has exerted considerable influence in developing the national policy in regard to secondary education. D.Sc.—Mr. Harold Wager, F.R.S., an expert on fungi. M.Sc.—Mr. Thomas Sheppard, F.G.S., F.R.G.S., F.S.A. (Scot), director of the Hull Museums, and president of the Yorkshire Naturalists' Union in 1914; Mr. J. W. Taylor, a former president of the Yorkshire Naturalists' Union; Mr. T. W. Woodhead, Ph.D., F.L.S., hon. secretary of the Yorkshire Naturalists' Union and head of the natural history department of the Huddersfield Technical College; Mr. T. H. Nelson, a prominent member of the Yorkshire Naturalists' Union and an expert in ornithology; Mr. W. Denison Roebuck, for many years hon. secretary and treasurer of the Yorkshire Naturalists' Union; Mr. John Wilkinson, of Leeds, well known as the blind botanist. It was fitting, Mr. Lupton remarked, that the excellent amateur work rendered to science by the Yorkshire Naturalists' Union should be recognised by the conferring of honorary degrees upon a few representative members. The Court formally confirmed the action of the committee, and fixed upon July 3rd as the degree day.

HONOUR FOR A LEEDS PROFESSOR.

The Trustees of Columbia University in the City of New York have awarded the Barnard gold medal to Professor W. H. Bragg, F.R.S., Cavendish Professor of Physics in the University of Leeds, and his son, Mr. W. L. Bragg, Fellow of Trinity College, Cambridge, and a member of the college staff, at present holding a commission in the Leicestershire R.H.A. (T.F.), for their work on X-rays and crystals. The medal is awarded every five years for 'meritorious service to science,' on the recommendation of the National Academy of Sciences of the United States. The previous recipients have been Lord Rayleigh and Sir William Ramsay, Professor von Rontgen, Professor Henri Becquerel, and Professor Sir Ernest Rutherford.

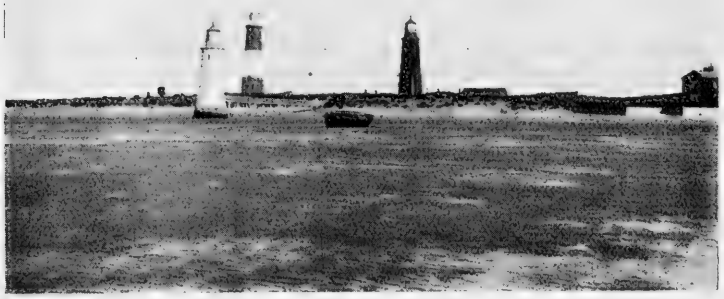
MR. W. N. CHEESMAN, J.P.

At the invitation of the Executive Committee of the Yorkshire Naturalists' Union, Mr. W. Norwood Cheesman, J.P., of Selby, has accepted the Presidency of the Union for 1916.

Mr. Cheesman's work is well known to our readers, and *The Naturalist* is indebted to him for a number of racy papers. Yorkshire naturalists will certainly look forward to seeing him with them at the various meetings during the year.

SPURN LIGHTS IN 1895.

The accompanying block is made from a photograph taken by Mr. J. Darker Butterell, and is the only illustration we know showing three lighthouses on Spurn Point. It was taken just before Smeaton's 'old light' was demolished, the wall around which, known as the 'compound,' still exists. Mr. Heseltine, of



the Hull Trinity House, informs us that the old lighthouse was taken down in 1895, so that the photograph would be taken just before that.

ARCADIA.

It is refreshing to find a sample of mediaeval rurality now and again, as for example the following report taken from a recent issue of the daily press. It is headed, 'May Day at Sompting.'—'War time made no difference to the celebration of May Day at Sompting. In gala attire, and carrying garlands and floral wands, the children assembled early at the Abbots, where they went through the picturesque ceremony of crowning the May Queen. The regal honours fell this year on little Kitty Varndell, and her attendants were Kathleen Richardson and Olive Pierce. The Queen was "enthroned" in a donkey cart beneath a canopy of flowers and foliage. After the crowning came the procession through the village, the children singing patriotic songs as they merrily marched along. The Queen and her retinue led the way, and Britannia, with shield and tripod [!] was conspicuous among the masqueraders. At the residence of Mr. A. Pullen-Burry the children danced around the Maypole and sang appropriate songs. They were rewarded

with refreshments. Afterwards they went on to Lower Cokeham, where Mr. Dillstone provided oranges, and there the celebration came to an end. Mr. Pullen-Burry kindly placed a field of flowers at the disposal of the children for their festival, and they were allowed to pick all the daffodils, wallflowers, etc., that they wanted. Mr. Archard (Schoolmaster) undertook the organization, and had the assistance of Miss Barrett and the Misses Honnywill.'

GUN-FLINTS.

It is interesting at the present time, says Mr. Wilfred Mark Webb in *Knowledge*, when the manufacture of cartridges and shells is of the utmost importance to the nation, to remember that the production of gun-flints still goes quietly on. Thousands are exported every year, particularly to tropical countries, where more primitive methods linger or are found to be more convenient; or, again, where the British Government sees to it that modern firearms do not get into the hands of the natives. There seems little doubt but that the maker of gun-flints, or the flint-knapper, as he is called, is carrying on an industry which has continued unbroken from very early prehistoric times, when man first began to fashion implements of stone. It would appear, nevertheless, at first sight that there is a fallacy somewhere, and that there must have been a very long gap between the dying out of the flint arrowhead and the invention of the flint-lock musket. This is true; but it must be remembered that the flint in the guns was put there to produce sparks, and was only an adaptation of the strike-a-lights which all through the ages, and even within the memory of many persons still alive, have been used for the purpose of obtaining fire. There is, indeed, a considerable family likeness between the flints made for the tinder-box and the prehistoric flint implements which are known as 'scrapers.'

LINCOLNSHIRE NATURALISTS.

The Lincolnshire Naturalists' Union Transactions (pages 151-212), for 1914, contain Miss S. C. Stow's presidential address on 'Plant Galls' and a lengthy account of 'The Birds of Lincolnshire,' by F. L. Blathwayt. In addition are the reports of the general secretary and of the sectional officers, namely, E. A. Woodruffe-Peacock, W. Denison Roebuck, G. W. Mason, J. F. Musham and F. L. Blathwayt. There are one of two shorter notes dealing with *Cakile maritima*, 'The Crested Lark,' and *Passer domesticus*. The frontispiece is a portrait of the Rev. Alfred Hunt, M.A., President 1907-8, with the usual memoir, which is as usual inaccurately headed 'The Presidents of the Lincolnshire Naturalists' Union.' If it is one of a series, the number should be given. Lincolnshire geologists are apparently inactive at the moment.

CUMBERLAND NATURE RESERVE ASSOCIATION.

As will be seen from the report in another column this Association is doing excellent work in a part of the country which we hope may for all time remain in as natural a state as possible. The district and its fauna and flora appeal to many besides those living in the neighbourhood, and the secretary, Mr. Linnaeus E. Hope, F.L.S., of The Museum, Carlisle, would be very pleased to have subscriptions, however small, which he assures us would be put to a very good service.

BLAKENEY POINT.

The National Trust has issued an interesting report on

Photo by] [*W. Rowan.*

Little Tern—sitting.

'Blakeney Point in 1914,' which includes the report of the Management Committee and the Laboratory Report. Special reference is made to the sections of the Bird Colony, and there is some interesting information with regard to the flora. The report is illustrated; one of the blocks we are kindly permitted to reproduce. The similarity between Blakeney Point and its flora and fauna to that of Spurn is remarkable.

CORRESPONDING SOCIETIES' COMMITTEE.

The Report of the Corresponding Societies' Committee and of the Conference of Delegates held at Harve has been issued by the British Association, 134 pages, 1s. net. It contains Sir George Fordham's paper on "The History of the Endeavour to Co-

ordinate the Work of Local Scientific Societies in Great Britain,' and Mr. John Hopkinson's on 'Local Natural History Societies and their Publications,' with discussions. Mr. Hopkinson's paper has already been fully dealt with in this journal. There is also a suggestion for a 'Bibliography of the Publications of Local Scientific Societies,' and the usual useful classified list of contents of the publications of the Affiliated Societies.

THE BRITISH ASSOCIATION.

For the meeting of the British Association, to be held at Manchester from September 7th to 11th, under the presidency of Professor Arthur Schuster, the following sectional Presidents have been appointed:—Mathematics and Physics—Sir F. W. Dyson. Chemistry—Professor H. B. Baker. Geology—Professor Grenville Cole. Zoology—Professor E. A. Minchin. Geography—Captain H. G. Lyons. Economics—Dr. W. R. Scott. Engineering—Dr. H. S. Hele-Shaw. Anthropology—Dr. C. G. Seligman. Physiology—Professor W. M. Bayliss. Botany—Professor W. H. Lang. Education—Mrs. Henry Sidgwick. Agriculture—Mr. R. H. Rew. Evening discourses will be delivered by Mr. H. W. T. Wager on 'The Behaviour of Plants in Response to Light,' and by Dr. R. Sampson, Astronomer Royal for Scotland.

THE HOUSE-FLY;*

A MONOGRAPH;

If the science of entomology needed any justification it is afforded in this remarkable volume. Here we have a book of 382 pages devoted to a single small insect of the Diptera, but dealing with it in such a way that the book is indispensable not only to the student of entomology, but to medical men and officers of health. Moreover, apart from the chapter dealing with the technical and detailed structure of the house-fly, the book is extremely readable and interesting to the general reader.

Among the numerous and remarkable advances which have been made in the realm of medical science within the last twenty years, none has created so wide a public interest, and none has been destined to affect the future welfare and progress of mankind to so great a degree, as the discovery of the role which insects play in the dissemination of disease. We read much nowadays of the havoc caused by the mosquito, by the flea, and by lice. Of all revelations, however, none affects so great a number of people in all countries, both by its significance and effects, as the demonstration of the disease-carrying power of the common house-fly. The presentation of our knowledge

* *Musca domestica* Linn., its structure, habits, development, relation to disease and control, by C. Gordon Hewitt, D.Sc., F.R.S.C. (Cambridge University Press, 15s. 8vo, pp. 282+viii.).

of this insect, its habits, and relation to disease, has thus been rendered very desirable, and this difficult task the author has undertaken with great success.

ITS CONTENTS.

There are chapters dealing with the Structure and Habits of the House-Fly; The Breeding Habits, Life History and Structure of the Larva; The Natural Enemies and Parasites of the House-Fly; Other Species of Flies frequenting Houses; The Relation of House-Flies to Disease; and Control Measures. The chapters are illustrated by a number of coloured plates very beautifully executed, and by a large number of illustrations in the text. As showing the enormous amount of literature on the subject it may be mentioned that the Bibliography takes up 36 pages.

HIBERNATION OF 'MUSCA DOMESTICA.'

The author goes very fully into the question of hibernation of the House-Fly. The disappearance of flies towards the end of October and during November is a well known fact and the question is frequently asked, what becomes of them? To this disappearance three causes contribute, namely, retreat into hibernating quarters or into permanently heated places, natural death and death from the parasitic fungus, *Empusa muscæ*. The natural death of flies he considers may be compared to the like phenomenon that occurs in the case of the hive-bee, *Apis mellifica*, where many of the workers die at the end of the season by the fact that they are simply worn out, their function having been fulfilled.

FAT FLIES.

The flies which die naturally have probably bred for many weeks or months during the summer and autumn, and in the case of the females have deposited many batches of eggs; their life work, therefore, is complete. Those flies which hibernate are the most recently emerged, and therefore, the youngest and most vigorous. On dissection it is found that the abdomens of these hibernating individuals are packed with fat cells, the fat body having developed enormously. Mature spermatozoa have been found in hibernating males. In some females it was found that the ovaries were small and in others very well developed.

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The Proceedings of the Liverpool Naturalists' Field Club for 1914 (84 pages) contain Mr. J. W. Ellis's account of the Field Meetings, which is mostly botanical; and Part 4 (Conclusion) of 'Wirral Fungi,' by the same author.

The Transactions of the Entomological Society of London, issued April 21st, contain the presidential address of G. T. Bethune-Baker, which deals with 'The Development of Clasping Organs in Insects.' It is remarkably well illustrated.

A CUMBERLAND NATURE RESERVE.

ALTHOUGH the first General Meeting of the Cumberland Nature Reserve Association took place on March 14th, 1913, when a Council and Officers were elected, the active existence of the Association commenced in February, 1914.

The offer by the Corporation of Carlisle to hand to the Museum Committee the historic common of Kingmoor to be used as a Nature Reserve was the initial step, and a very ample basis upon which to found a Nature Reserve Association. It was shewn, however, that a *Cumberland* Nature Reserve Association entailed a much wider scope of action, and that there were many animals and plants in the county which urgently required adequate protection, which were not numbered amongst the denizens of Kingmoor Common or Wood, and which might possibly never be included within the limits of any Nature Reserve or sanctuary established in the county. Therefore the objects of the "Cumberland Nature Reserve Association" include the establishment and assisting in the upkeep of Nature Reserves in the county, as well as a scheme for the protection of animals outside any such provisional area.

There are three birds nesting in this county which are the especial objective of egg collectors, viz.:—the Peregrine Falcon, the Common Buzzard and the Raven. These fine birds required the careful attention of the Association, and a scheme was devized which has proved highly successful. These birds' eyries or nests occupy extremely isolated positions, and to engage permanent watchers for the numerous areas in which they occur would be impracticable. A member of the Committee, Mr. Eric B. Dunlop, undertook to locate nests or eyries of these species and report to the Sub-Committee appointed to deal with the matter, where possible; arrangements were then made with a resident in the district who undertook to look after the nest, prevent molestation and report to the Sub-Committee when necessary. If the birds successfully reared their young he was paid a certain amount agreed upon.

During the spring of 1914 we had three Raven's nests, two Buzzard's eyries and one Peregrine's eyrie under supervision, all of which successfully reared young. The Peregrine and two of the Ravens are known to have previously endeavoured unsuccessfully for several years to raise their broods.

To enable the Association to undertake this work, it was necessary to acquire funds, and therefore the Council of the Association decided to establish a 'Watchers' Fund.' A circular was printed drawing attention to the Association's work and requesting subscriptions.

The Association hopes to extend the scope of this phase

of its work in future years if sufficient financial support is obtained.

Turning to what was primarily the object of the Association, the promotion and provision of Nature Reserves in Cumberland, local Secretaries, Miss Newling and Mr. Ritson, have been appointed in two districts, viz., Keswick and Wigton, in the hope that suitable tracts of country will eventually be set apart and properly administered by a local Committee.

Kingmoor Nature Reserve is the only fully constituted and affiliated Reserve yet in the county, and in spite of many difficulties encountered by the Reserve Committee, and the despoliation of the land as a primitive tract which had been going on for years, it is a great success.

A grant of £25 from the funds was made for 1914, and from that the Committee have done much good and necessary work, and provided a regular keeper from April to September. A bungalow was erected for the use of the keeper and wardens, the building being the gift of Mr. F. W. Halton, while timber for repairs and additions was given by Mr. A. Anderson. Major Spencer Ferguson (Mayor of Carlisle), Mr. D. Losh Thorpe, and the Hon. Secretary spent much time in arranging and providing these necessaries, which included a suitable drinking pond for birds.

Three gentlemen were appointed to compile lists of the Flora and Fauna of the Reserve with a view to comparison with past records and also with future developments, viz. :— Mr. F. H. Day for Insects ; Mr. T. Scott Johnstone, for Flowering plants and general botany ; and Mr. Jas. Murray, for the Mosses and Liverworts.

Mr. Day records 15 species of Butterflies, 122 species of Moths and 257 species of Beetles. Three of the beetles are new to Cumberland, viz., *Apion genistæ*, *Helophorus quadrisignatus* and *Psylliodes affinis*.

Mr. Johnstone reports the identification of 120 plants growing on the common and in the wood. Some of these are quite rare and have been previously recorded, among them being the Whorl-leaved Meadow-Parsnip, *Carum verticillatum*, recorded by T. C. Heysham in 1837. It appears to be increasing, but on the other hand at least 10 of the previously recorded species have not been seen during the past year. Twelve hundred species of flowering plants have been recorded for the whole of Cumberland, so that Kingmoor Nature Reserve, with an area of less than 50 acres, can show exactly 10 per cent. of the Flora of the county. The list will doubtless be considerably increased in future years.

Mr. J. Murray reports that the locality is not a good one for either mosses or liverworts, and that some of those noted were abnormally stunted and ill-developed. This year he

identified 12 species of mosses and three liverworts, but states that no doubt further searches will produce more species.

Messrs. D. Losh Thorpe, Geo. Davidson, the Secretary, the Rev. H. D. Ford and Miss E. Newling are responsible for the particulars of the Vertebrates of the Reserve, and a list of 43 species of birds seen on the Common has been drawn up, 27 of which nested or reared their young, while 4 species of Mammals and 3 of Reptilia and Batrachia were recorded.

The Glaucous Gull, Great-Spotted Woodpecker and Grasshopper Warbler are the best species recorded; the last mentioned nested on the Common.

The keeper had at one time about 100 nests of various species under observation, and this was probably doubled or trebled as a total during the season. The most conspicuous species was the Willow-Warbler.

Over 60 nesting boxes were fixed in the wood, provided by Messrs. D. Losh Thorpe and F. Wright, 50 per cent. of which were used, chiefly by Blue-tits. The Committee is greatly indebted to Mr. Lamb and his tenant Mr. Graham, of Kingmoor Farm, for the permission to include the wood in the Reserve area.

Out of the whole number of nests of birds under observation in the area, which included Pheasant and Partridge, only 6 nests were noticed destroyed—three by a grass fire which occurred in May, one, a waterhen, by a dog killing the old bird, one, a Willow-Warbler's, the old bird killed by a weasel, and one Blackbird's nest robbed by a Magpie.

At the General Meeting in December, the Officers were elected as follows:—*President,* The Speaker of the House of Commons, the Rt. Hon. J. W. Lowther; *Vice-Presidents,* Sir Benjamin Scott, J.P., Sir R. A. Allison, J.P., The Mayor of Carlisle, F. P. Dixon, Esq., J.P., The Mayor of Whitehaven: H. W. Walker, Esq., J.P., R. Heywood Thompson Esq., J.P., F. P. Johnson, Esq., J.P., M.B.O.U., Henry Gandy, Esq., J.P., Harold Carr, Esq., E. R. Sheldon, Esq.; *Chairman,* Major Spencer C. Ferguson, J.P.; *Vice-Chairman,* D. Losh Thorpe, Esq., M.B.O.U.; *Hon. Secretary and Treasurer,* Linnæus E. Hope, Esq., F.L.S.

L.E.H.

List of Birds seen in Kingmoor Reserve, 1914.

*Mistle Thrush	*Sedge Warbler	*Linnet
*Song Thrush	*Grasshopper Warbler	*Bullfinch
*Blackbird	*Hedge Sparrow	*Yellowhammer
*Redbreast	*Wren	Spotted Flycatcher
*Whinchat	*Tree Creeper	Swallow
*Whitethroat	House Sparrow	Great Tit
*Willow Warbler	*Chaffinch	*Blue Tit
*Wood Warbler	*Greenfinch	Coal Tit

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*Tree Pipit	Swift	*Moorhen
*Pied Wagtail	Cuckoo	Redshank
Skylark	Great Spotted Wood-pecker	Lapwing
Starling	*Wood Pigeon	Curlew
*Magpie	*Partridge	Blackheaded Gull
*Rook	*Pheasant	Glaucous Gull
Carrion Crow		

This list does not include birds recorded before 1914, and of which Mr. B. Johnston has a list of 37 additional species.

Mammals.

Common Shrew	Mole
Rabbit	Weasel

Amphibia and Reptilia.

Frog	Toad	Common Lizard

Entomology—Mr. Day writes :—Years ago, because of its nearness to Carlisle, Kingmoor was much frequented by collectors of butterflies and moths, and interesting insects were captured from time to time. For the last ten years or so the place has been neglected, as it was found that many of the species were becoming scarce or disappearing altogether. I have drawn up a list of the various butterflies and moths (to the end of the Geometræ) which I know have occurred there, mostly based on my own investigations. The list includes 15 species of butterflies—rather more than one fifth of the British fauna, a really excellent list for such a small area.

Of the moths I have records of 122 species, and I believe this number could be added to extensively.

The Lepidopterous fauna being so well known, I did not, during the present season, spend much time in investigating it any further, but I noticed the ' Orange tip ' was common on the dampish ground about half way down the moor.

Lepidoptera.

Rhopalocera (butterflies).

Pieris brassicæ L.
P. rapæ L.
P. napi, L.
Euchloe cardamines L.
Aglais urticæ L.
Pyrameis atalanta L.
Pyrameis cardui L.
Pararge megæra L.
Satyrus semele L.
Epinephele janira L.
E. hyperanthus L.
Cœnonympha pamphilus L.
Rumicia phlæas L.
Polyommatus icarus Rott.
Nisoniades tages L.

Bombyces.

Hylophila prasinana L.
Lithosia mesomella L.
Euchelia jacobææ L.
Nemeophila russula L.
Arctia caia L.
Spilosoma fuliginosa L.
S. menthastri Esp.
Hepialus humuli L.
H. velleda Hb.

* Nested in the Reserve.

Hepialus lupulinus L.
Cossus ligniperda Fb.
Dasychira fascelina L.
Bombyx rubi L.
B. quercus L. var. *callunæ* Palmer.
Odonestis potatoria L.
Saturnia pavonia L.
Drepana falcataria L.
Cilix glaucata Scop.
Dicranura vinula L.
Phalera bucephala L.
Pygæra pigra Hufn.
Thyatira batis L.
Asphalia flavicornis L.

NOCTUÆ.

Acronycta psi L.
A. rumicis L.
Diloba cæruleocephala L.
Leucania conigera F.
L. lithargyria Esp.
L. impura Hb.
L. pallens L.
Tapinostola fulva Hb.
Axylia putris L.
Xylophasia rurea F.
X. lithoxylea F.
X. monoglypha Hufn.
Charæas graminis L.
Apamea basilinea F.
A. gemina Hb.
A. didyma Esp.
Miana strigilis Clerck.
M. fasciuncula Haw.
Agrotis segetum Schiff.
A. exclamationis L.
A. strigula Thnb.
Noctua augur F.
N. plecta L.
N. brunnea F.
N. festiva Hb.
N. baja F.
N. xanthographa F.
Triphæna comes, Hb.
T. pronuba L.
Tæniocampa incerta Hufn.
T. cruda Hb.
T. gothica L.
T. stabilis View.
Anchocelis rufina L.
A. litura L.
Cerastis vaccinii L.
Scopelosoma satellita L.
Xanthia fulvago L.
X. flavago F.
Miselia oxyacanthæ F.
Agriopis aprilina F.
Phlogophora meticulosa L.
Hadena protea Bork.
H. oleracea L.
Hadena pisi L.
H. thalassina Rott.
Xylocampa areola Esp.
Calocampa exoleta L.
Plusia gamma L.
Anarta myrtilli L.
Phytometra viridaria Clerck.
Hypena proboscidalis L.
Hypenodes costæstrigalis St.

GEOMETRAE.

Uropteryx sambucaria L.
Epione apiciaria Schiff.
Rumia luteolata L.
Selenia bilunaria Esp.
Odontopera bidentata Clerck.
Himera pennaria L.
Phigalia pedaria Fb.
Amphidasys strataria Hufn.
A. betularia L.
Cleora lichenaria Hufn.
Boarmia repandata L.
Pseudoterpna pruinata Hufn.
Geometra papilionaria L.
Iodis lactearia L.
Asthenia candidata Schiff.
Acidalia bisetata Hufn.
A. remutaria Hb.
Cabera pusaria L.
C. exanthemata Scop.
Ematurga atomaria L.
Aspilates strigillaria Hb.
Abraxas grossulariata L.
Lomaspilis marginata L.
Hybernia rupicapraria Hb.
H. marginaria Bork.
H. defoliaria Clerck.
Cheimatobia brumata L.
Oporabia dilutata Bork.
Larentia didymata L.
L. multistrigaria Haw.
L. viridaria Fb.
Emmelesia albulata Schiff.
Eupithecia nanata Hb.
E. minutata Gn.
Hypsipetes sordidata Fb.
Melanippe sociata Bork.
M. montanata Bork.
M fluctuata L.
Camptogramma bilineata L.
Cidaria siterata Hufn.
C. corylata Thnb.
C. truncata Hufn.
C. immanata Haw.
C. testata L.
Pelurga comitata L.
Eubolia palumbaria Bork.
Chesias spartiata Fues.
Tanagra atrata L.

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(*To be continued.*)

GRIMMIA HARTMANI, Schp.

AN ADDITION TO THE YORKSHIRE MOSS FLORA.

CHRIS. A. CHEETHAM.

On the occasion of the recent Bryological meeting in Crummock Dale, a moss was gathered which agreed with the description of the above in all but general colour, it has since been submitted to Mr. H. N. Dixon, F.L.S., who has kindly verified the identification.

A subsequent visit shows the moss to be fairly plentiful, and suggests that it may have been overlooked as *Rhacomitrium heterostichum* with which it is associated; the colour is similar, green above, black below, but it lacks the usual hoary appearance of *R. heterostichum* owing to the very short hyaline points, and it is more compact and neater in growth. The habitat is on scattered siliceous boulders, not in streams nor where likely to be submerged at any time, the situation is sub-alpine as is shown by the Andreæas, etc., in the vicinity, although the altitude is only 750 feet above O.D.

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Ancient Hunters and their Modern Representatives. By **W. J. Sollas,** Macmillan & Co., 591 pages, 15s. net. The fact that this volume has reached its second edition within four years, speaks well for its popularity. In the present edition many changes and amplifications, etc., have been made as a result of recent research; in fact, the amount of new information that has been obtained with regard to primitive man in recent years is extraordinary.

Text-Book of Embryology. Volume i., Invertebrata. By **Professor E. W. MacBride.** Pp. xxxii+692. London: Messrs. Macmillan & Co. Price, 25s. net. Since the publication of Balfour's work on Comparative Embryology in 1880, many additions have been made to our knowledge of this intensely interesting branch of zoology. The need of a work putting forward concisely the results of recent research in animal development has for some time been urgent. This is now met, as far as the Invertebrata are concerned, by the publication of Professor MacBride's handsome text-book. Its arrangement is a distinct improvement on the earlier work of Balfour and contains some quite new and useful features. The plan followed is to describe a number of typical life-histories, illustrating all the important groups of Invertebrata, selecting types which have been fully worked out, and as far as possible, such as are easily accessible to students in temperate regions. Thus the spider has been chosen as a type of the Arachnida rather than the more generalised scorpion. A general account of the development of other members of the group follows the description of the type. In indicating some of the problems in the field of embryology which still remain to be solved, and also in giving an account of the methods of microscopical technique used by the best investigators, the book will prove invaluable to students. It contains nearly five hundred illustrations, and is provided with a copious index and bibliographies of the more important works referred to. It is printed and got up in that excellent way of which Messrs, Macmillans' name is the hall-mark, and the volume should certainly be acquired by every public and scientific society's library.

A DIARY OF ORNITHOLOGICAL OBSERVATIONS IN BRITTANY.

EDMUND SELOUS.

(*Continued from page 163*).

JULY 12TH.—The following was observed by me this morning, during about an hour's watching. At 7 the female flew in to the nest and fed the young twice in rapid succession. She had left it only the moment before on the 'rattle' of the male, somewhere near. At 7-13 there were two more such quick-recurring visits, and at 7-14 another, each time, I think, the female. At 7-15 there is a double visit of both the birds. Both I think feed the young, the first certainly, and it is the second arrival that now broods. 7-18, bird rises on nest, and resettles itself; 7-19, two quickly repeated conjugal visits (with food, that is to say), to the sitting bird, and the latter feeds the young with this, and then flies off; 7-23, a bird flies in and broods the young; 7-24, a conjugal visit, as before defined; 7-28, another, and now I feel assured that both parents brood the young, for the one that brought the food, and should therefore by previous observation, not contradicted so far as I had perceived in the present instance, be the male, showed the one upon the nest—the female—in many pretty ways, that it wished to take her place there. He pressed gently against her, looked a little anxious, toyed with his bill amongst the feathers of her breast, etc., but she, with a pretty insistence, still sat there, and was left in possession. I could see no other way of accounting for these actions than a desire on the part of the bird that used them to brood the young, and there was a certain indefinable look also, which made it unmistakeable. It is true that these actions in themselves seem more to designate the female, but in that case, the male was brooding. Either way, I have now no doubt that he shares this duty (as also probably that of incubation) with the female, though probably not equally; and this is so also, in the case of the Garden Warbler. The brooding bird remains till 7-40 and then, probably after taking food from the other, flies off, leaving the nest empty.

7-43, a bird flies in and feeds young, then broods them. This bird is so yellow that I think it must be the male. The nest, with the bird on it, now looks inconceivably pretty, with checkers of sunshine on the leafage about it.

7-47, the brooding bird shows signs of anxiety, gradually increasing till it flies off. A moment afterwards either it or its partner appears in the neighbourhood of the nest, and a moment after that one or other of them flies down and feeds the young. Having done so, it flies away at once, but either

is quickly back and feeds them again, or the other one does so, and there are two quick repetitions of this before the young are brooded by the last provider. This one, just before 8, receives a green caterpillar from the bill of its *cara sposo.*

JULY 16TH.—This afternoon I watched the nest at very close quarters for about an hour and a quarter. This proximity, which yet left the birds entirely at their ease, I achieved by pulling down the osier branches over and all around me, tying them together with string, and then thatching them, as it were, with bracken fronds. When all was completed I looked right into the nest at only a step or two away. My chief observations were as follows:—

(1) The habits of mutual accommodation, as between the parents and young which have arisen in relation to the defœcation of the latter. So accustomed has the chick become to have the excreta removed, immediately upon the performance of this function, that the time of the arrival at the nest of either parent has become connected in its mind with the act in question, nor will it, apparently, unless through necessity (which happens but rarely) relieve itself in this manner during the intervals between such visits, but concurrently with them, cocks up the anus, most evidently for the parent to perform this office. The parent does so, as a matter of course, and if there is any undue delay, pecks with its bill into the orifice, thus hastening the evacuation. But whether the parent also sometimes in the first instance, endeavours to induce the young to defœcate, when it has, as yet, made no motion towards it, I am not quite sure but think so, as it certainly directs its bill downwards to the chick in the nest, and, I think, to that part, whilst waiting obviously for this to take place. Moreover, the other makes this, being but a slight extension of it, in itself, probable.

(2) The occasional bringing to the nest of several flies at a time, with which two or more chicks are fed.

(3) Once something very peculiar, viz., a long string, or rather chain of flies, hanging one from another, as though the legs had been threaded together. With this fly-chain, two chicks, as a minimum, were fed.

(4) The excreta were either swallowed, at once, upon removal by the parents, or else carried away by them.

(5) The 'rattling' or harsh chattering note which would be almost universally attributed to alarm or disquiet on the birds' part, was frequent, even when feeding was proceeding freely, and the young would often rise up open-mouthed in the nest, upon hearing it. There were numerous visits at irregular and mostly short intervals, and both parents fed the young. The time occupied was from about 6-30 to 7-45 p.m.

JULY 17TH.—At the nest again in the afternoon, at 2-50, getting under the very close shelter I had made, and, during an hour and 25 minutes from then, all my observations of yesterday were confirmed. The chicks most certainly look upon the visits of the parents as the proper occasions for defœcation, nor have I once either to-day or yesterday, seen them perform this act during the intervals of these, though representing a longer period of time. The parents are both very assiduous, the male nearly if not quite as much so as the female; there is little, I think, to choose between them. The food brought is mostly flies, including ephemerids and other small flying creatures, but caterpillars are given, from time to time, and twice this afternoon a Meadow-Brown Butterfly was brought and presented whole to one chick. On a former occasion, I had seen a bird of this species (possibly one of the pair) with a good-sized moth in its bill. Several flies are usually brought at a time, as with Wagtails, and once the male fed two with a sort of ball of them, first letting one peck two or three times at it, thus getting something, and then giving the residue to the other. On other occasions, two or perhaps all three of the young were fed, but it is more usual for one only to be at each visit. Twice both the parents were at the nest together, and each fed a chick.

JULY 18TH.—I sat and watched the pair at their nest, from my nest, as I might call it, from 6 p.m. to nearly 8-30 p.m. The young birds collectively defœcated during this time, either nine or ten times (I am not quite sure which, but I think ten) and every time was during the visit of one of the parent birds, who regularly took the dropping in transitu and either swallowed it there and then, or flew off with it. There was just one occasion, however, when the act was rather sudden, and the parent did not quite succeed in its attempt to seize the object, which fell to the ground. As with the Blackcap, on a similar failure, it immediately dived down after it, and either swallowed or carried it away in the bill—I cannot now speak certainly as to which. The food consisted almost wholly of flies, which were brought in, in little black balls, but there also were two butterflies, a white one and a meadow brown, and a caterpillar. Both parents took part in the feeding, which continued, at short intervals, till about 7-30 when there was a longer one of some twenty minutes. It then recommenced and went on till twelve minutes past eight, when, as the very last offering, the Meadow Brown Butterfly which I have mentioned was given by the female, who, a moment afterwards, came gently on to the nest, or, rather, the fledgling birds, for they now entirely filled it. It seemed rather a difficult matter for her to brood them, and she was often pushed up by one head or another and only got into position again with some

difficulty, but she sat at last completely covering all three, high above the level of the nest, like a little sylvan queen on her throne. At 8-15 the male was heard, and at 8-25 again, each time some little way off. It was just a single rattle the first time, several the second. All then became gradually still, but a little later, when 'the shades of night were falling fast' a Thrush began to sing, and was still singing when I left, at about half-past eight.

JULY 20TH.—Got up at 4. My watch was to-day indisposed, but as I postponed ablutions till my return, I must have been under cover by 4-30 at the latest. At first I thought the largest of the chicks was the hen on the nest, but the next moment she arrived and fed one, and the feeding then went on in the usual manner. Evidently, then, the birds begin their domestic duties with the first light of morning (it was hardly light at 4) and continue them till past eight in the evening, a sixteen hours day. As my object in coming (which had been to ascertain this) was now attained, and there was not likely to be any new thing to see, with this species, I did not stay longer, and in getting out of my quite perfect place of espial, made a rustle, which, though only a slight one, set both the birds off chattering—or rattling as I have called it, the sound is so continuous and peculiar—in quite a wonderful manner. Their anger, their indignation was extreme, causing them to assume all sorts of strained and violent attitudes, and, as I began to creep out on all fours, they clung to stems much lower down than is their custom, and, bending to the extreme length of their bodies, flung down their fury on my head. Nor were they alone, for a Robin, a Wren, and a hen Cirl Bunting now made part of the angry chorus, which reminded me of the frontispiece to Bates's 'Naturalist on the Amazons,' except that there they are all of one species—Toucans namely. But it at once struck me that birds, here at home, do not mob men in this way, but only Cats, and as only my head was now visible, and that half-hidden and near the ground, I made no doubt it was a Cat that I was taken for, especially as there is one often to be seen about here, and always received thus heartily. When I rose up my suspicion was at once confirmed, for there was an immediate dispersal to a greater distance and a drop in the intensity of the scolding. This reminds me that, a morning or two ago, a hen Cirl Bunting—probably this same bird—came into the neighbourhood of the nest, when there was an immediate jangle between her and these Warblers. Now again she had come within the prohibited degree of proximity, as also the other two, but, bound together by the stong tie of a common hostility, this point did not arise. The lesser casus belli had been merged in the larger one.

JULY 21ST.—On coming to the nest, this afternoon, I find

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it empty. This does not surprise me as the young are now fully large enough to have left the nest, and from sounds I hear in the thicket, and the behaviour of the old birds, I have no doubt they are still being tended and that all is in order. Had they been taken, the parents would now have nothing to be excited about, but would probably show signs of despondency and listlessness. By rustling and playing the Cat, I had them again about me, but this, perhaps, can hardly be used as an argument, since the stimulus would be in connection with the still more paramount law of self-preservation. However, the time was ripe for their departure, and it is perhaps even still more decisive for their having departed, and in peace, that the nest remains *in situ* and intact.

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Geology of To-Day. By **Prof. J. W. Gregory, F.R.S.** London: Seeley, Service & Co., Ltd., 328 pages, 5s. net. This is 'A Popular Introduction in Simple Language.' The book is divided into four sections, Introductory, Physical Geology, Historical Geology, and The Story of Life on the Earth. Each section is really a small book in itself, and may be said to contain the most recent information on the subject dealt with. The illustrations and diagrams given with the volume are remarkably fine. An indication of the up-to-dateness of the book is shown by the fact that the Piltdown skull is described. It is a well printed volume and is remarkably cheap at 5s. The frontispiece shows a statue of Agassiz thrown from its niche above Arches, Stanford University, and is one of the most extraordinary geological photographs we have seen.

Plant Life in the British Isles. By **A. R. Horwood.** London.: J. and A. Churchill, 1915, Vol. III., pp. xvi.+513, 6s. 6d. net. This is the third and concluding volume on 'Plant Life in the British Isles,' by Mr. Horwood, and follows similar lines to the two earlier volumes already noticed in the pages of this journal. In an introduction of 95 pages, the author deals with what he terms 'the main principles of botany in brief.' As in the previous volumes, this consists of a scrappy condensation of facts and fancies gleaned from a very varied literature, rather than a clear enunciation of those elementary principles which it is necessary to place before the beginner, for whom the work is written. In his endeavour to bring in a wide range of subjects, the references are often too brief to be of value and tend rather to confusion than helpfulness. Teleological explanations are much to the fore, and are sure to produce erroneous impressions in the mind of the young botanist. The very wide field covered, naturally carries the author at times out of his depth, but he errs also on simpler points, as when, on page 46, he refers to the germination of the seed as 'the initial stage of a new generation.' It will be news to the field botanist that the Marsh Samphire (*Salicornia herbacea*) 'is found in all parts of the British Isles.' The Saltwort (*Salsola*), we are told 'is one of the strand plants which take the place of a sand-dune formation where no dunes are formed.' This we suppose is an illustration of Ecology! Although, on page 330, we are assured that the seeds of the Bluebell 'are dispersed by the wind,' those familiar with our common woodland plants will be convinced with difficulty that this is the usual mode of dispersal, or even that the smooth globular seeds are well adapted for this purpose. Notwithstanding these blemishes, the author has brought together a large collection of interesting facts concerning our wild flowers, and the 121 photographic illustrations are a further aid to the usefulness of this well-printed volume.

YORKSHIRE COLEOPTERA IN 1914.

W. J. FORDHAM, M.R.C.S., F.E.S.

(*Continued from page* 167).

**Meligethes brunnicornis* Stm. Filey, a dark form. E. C. H.
†*Meligethes ovatus* Stm. Great Ayton, one by sweeping in Airyholme Wood, August. M. L. T.
Ips 4 *punctata* Hbst. Bubwith, flood refuse. W. J. F.
†*Ips* 4 *pustulata* L. Buckden, 1910. T. Stringer. (J. W. C.).
Rhizophagus cribratus Gyll. Raincliff Wood. E. C. H.
nitidulus F. Raincliff Wood and Stoney Haggs. E. C. H.
dispar Pk. var. *punctulatus* Guill. (=*oblongocollis* Blch.) Stoney Haggs. E. C. H.
**Enicmus testaceus* Steph. Filey. E. C. H.
**Corticaria serrata* Pk. Filey. E. C. H.
†*Melanophthalma transversalis* Gyll var. *wollastoni* Wat. Filey. E. C. H.
**Byturus sambuci* Scop. Filey. E. C. H.
tomentosus F. var. *flavescens* Marsh. Raincliff Wood. E. C. H.
**Telmatophilus caricis* Ol. Sandall Beat, 15/6/1913. H. H. C.
Cryptophagus setulosus Stm. Selby, in diseased potatoes. J. F. Musham.
† *pallidus* Stm. Selby, in diseased potatoes. J. F. Musham.
† *saginatus* Stm. Doncaster, October 1907. H. H. C. Bubwith, 1912. W. J. F.
† *umbratus* Er. Filey, in nest of field mouse. E. C. H.
distinguendus Stm. Cusworth. H. H. C.
**Ephistemus globosus* Waltl. Bubwith. W. J. F.
gyrinoides Marsh. Cloughton. E. C. H.
**Scaphisoma boleti* Pz. Escrick. W. J. F.
Litargus bifasciatus F. Wheatley Wood, April, very common under bark of felled trees. H. H. C. T. H. B.
Elmis parallelopipedus Müll., *E. subviolaceus* Müll., *E. cupreus* Müll. and *E. nitens* Müll. Richmond, by sweeping long grass by the river, August. G. B. W.
Aphodius scybalarius F. var. *conflagratus* Ol. Filey. E. C. H.
constans Duft. Ingleby Moor, Cleveland. A. A. Fordham.
† *granarius* L. Escrick, 1910. W. J. F.
* *pusillus* Hbst. Knaresborough. H. V. C. Bubwith. W. J. F. (new both to W. & E. Ridings).
* *depressus* Kug. var. *nigripes* Steph. (=*atramentarius* Er.) Bubwith. W. J. F. Bempton. E. C. H.
* *obliteratus* Pz. East Cottingwith. W. J. F.

Cryptohypnus dermestoides Hbst. and var. 4 *guttatus* Lap. Swale Bridge. Richmond, abundant, August. G. B. W.
**Cryptohypnus dermestoides* Hbst. var. 4 *guttatus* Lap. Filey. E. C. H. (The type form is not yet recorded from E. Yorks.).
**Agriotes sputator* L. Filey. E. C. H.
Corymbites holosericeus F. Dalby Warren, Thornton Dale. C. Hill. (E. C. H.).
metallicus Pk. Bubwith, a few by sweeping umbellifers on river bank. W. J. F.
**Cyphon nitidulus* Th. Bubwith, 1912. W. J. F. (Since reporting this as a new county record. I find a record from Hayburn Wyke. *Nat.*, 1891, pp. 287-8).
Lampyris noctiluca L. Scarth Nick near Redmire in Wensleydale, very abundant in June. G. B. W.
Ancistronycha abdominalis F. Arncliffe. F. Booth. (J.W.C.).
**Telephorus lituratus* Fall. Bubwith. W. J. F.
* *thoracicus* Ol. Bubwith. W. J. F.
Ptilinus pectinicornis L Bubwith. W. J. F.
**Chrysomela orichalcia* Müll. var. *hobsoni* Steph. Bubwith. W. J. F.
Galerucella calmariensis L. Filey. E. C. H. (Recorded from Filey in 1878 by Canon Fowler).
* *tenella* L. Bubwith. W. J. F.
† *pusilla* Weise. Bubwith, 1912. W. J. F.
**Phyllotreta flexuosa* Ill. Filey. E. C. H.
* *exclamationis* Thunb. Thorne, sweeping April. H. H. C.
**Batophila rubi* Pk. Filey. E. C. H.
Chalcoides fulvicornis F. (=*smaragdina* Foud). †var. *picicornis* Weise. Great Ayton, Sallows, August. M. L. T. Bubwith. W. J. F.
**Hippuriphila modeeri* L. Bubwith. W. J. F.
**Tetratoma fungorum* F. Skipwith. W. J. F.
Salpingus aeratus Muls. Ringing Keld Bog. E. C. H.
Metœcus paradoxus L. Richmond, a fair number in wasp's nest, October. J. B. Howard. (G. B. W.).
Brachytarsus varius F. Thorne, April, sweeping. H. H. C.
Rhynchites cupreus L. Kildale, mountain ash, June. M. L. T.
Apion cruentatum Walt. Raincliff Wood, mole's nest. R. A. Taylor. (E. C. H.).
pallipes Kirb. Silpho Moor. E. C. H. Filey. E. C. H Richmond. G. B. W.
* *bohemani* Th. Filey. E. C. H.
* *trifolii* L. Richmond, August, common. G. B. W.
* *nigritarse* Kirb. Bubwith. W. J. F. (also Richmond. G. B. W. Arncliffe Wood. M. L. T.)
aethiops Hbst. and *seniculum* Kub. Richmond. G.B.W

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Apion gyllenhali Kirb. Hackness. E. C. H.
Polydrusus cervinus L.ab. *maculosus* Hbst. Filey. E. C. H.
**Phyllobius maculicornis* Germ. Filey. E. C. H.
†*Sitones waterhousei* Walt. Cantley. H. H. C. (This confirms a previous doubtful record. See Ann. and Mag. of Nat. Hist. XVII., 1846, p. 235).
†*Bagous limosus* Gyll. Thorne, April, probably common. H. H. C.
†*Anthonomus pedicularius* L. var. *conspersus* Desb. Kildale and Glaisdale, July, August, common on mountain ash. M. L. T.
Nanophyes lythri F. Thorne, April, sweeping. H. H. C.
†*Ceuthorhynchus cyanipennis* Germ. Filey. E. C. H.
**Rhinoncus castor* F. Bubwith. W. J. F.
Phytobius 4-tuberculatus F. Roundhay Park, sparingly in moss on walls in spring. E. W. M.
**Hylastes palliatus* Gyll. Wheatley Wood, April, one under bark of felled tree. H. H. C. T. H. B.
**Phloeophthorus rhododactylus* Marsh. Bubwith, 1910. W.J.F. Filey. E. C. H.
Dryocœtes villosus F. Cusworth, April, swarms. H. H. C. T. H. B.
**Pityogenes bidentatus* Hbst. Lonsdale, Cleveland, 1908. W. J. F.
Xyloterus domesticus L. Wheatley and Cusworth, under bark, April. H. H. C.
†*Xyloterus signatus* F. (= *Trypodendron quercus* Eich). Wheatley and Cusworth, under bark, April. H. H. C.
†*Xyleborus dryographus* Ratz. Cusworth, April, a few. H.H.C. T. H. B.

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The Board of Agriculture and Fisheries has recently issued special leaflets, Nos. 11, 24, 28, 29, dealing with Poultry Houses and Appliances for Allotment Holders, Cottagers, and others; Seed Testing; Suggestions for the Cultivation of Catch Crops and Home Grown Feeding Stuffs; and Flax Growing for Fibre.

From Professor G. F. Atkinson, whose presence at one of the Yorkshire Fungus Forays will be remembered by many, we have received the following interesting papers:—'The Development of *Armillaria mellea*,' 'Homology of the "Universal Veil" in *Agaricus*,' 'The Development of *Amanitopsis vaginata*,' 'The development of *Lepiota clypeolaria*,' and 'The Development of *Agaricus arvensis* and *A. comtulus*.'

From Mr. T. Petch, B.A., B.Sc., one of our workers in Ceylon, we have received a number of interesting communications, namely, 'Havea Tapping Results, Experiment Station, Peradeniya, 1911-1913,' 'The Tapping of an old Hevea Tree at Heneratgoda,' 'The Genera Hypocrella and Aschersonia,' and 'Notes on the History of the Plantation Rubber Industry of the East.' The first two are Nos. 12 and 13 Bulletins of the Department of Agriculture, Ceylon, while the third and fourth are reprinted from the 'Annals of the Royal Botanic Gardens, Peradeniya,' volume v., part 7, September, 1914.

THE SPIDERS OF WICKEN, WITH DESCRIPTION OF TWO NEW SPECIES.

WM. FALCONER,
Slaithwaite, Huddersfield.

In a paper published in *The Naturalist* for October, 1912, pp. 310-324, I recorded 107 species of spiders for Wicken, the famous naturalists' resort in Cambridgeshire. For the purpose of continuing the investigation of the fen and its vicinity, I have since paid the district two more extended visits, viz., from July 25th to August 1st, 1913, and from May 30th to June 6th, 1914. On both occasions favourable weather conditions were experienced, but on the other hand the great luxuriance of plant growths was found to be a decided hindrance to successful collecting, at least as regards spiders. Most of the rarities of the fen again occurred, amongst them being *Mengea warburtonii* Camb., which does not seem to have been noticed here, or has been unrecorded, since 1894; and the black variety of *Crustulina sticta* Camb., (1 ♀), which has been reported from various places in the South of England. At the Sycamores in the village further examples of *Scotophæus blackwallii* Thor., *Steatoda bipunctata* Linn., *Leptyphantes minutus* Bl., *Ero furcata* Vill., *Philodromus dispar* Walck., and in the fen, *Theridion pallens* Bl., *Leptyphantes tenuis* Bl., *Bolyphantes concolor* Wid., *Porrhomma microphthalmum* Camb., *Dicymbium nigrum* Bl., and *Walckenaera nudipalpis* Westr., were taken. *Marpessa pomatia* Walck. was again abundant, and in July the females were spun up in the heads of the reeds with their newly hatched young. Further examples of *Zora letifera* Falcr., were found to have the ocular pubescence, (evidently more fugacious in this species), which was said in the original description, *loc. cit.* pp. 319-20, to be wanting.

Altogether 112 different species were obtained, of which 30, although a good proportion of them are by no means rare, or restricted in distribution, do not appear to have been previously recorded for the locality. Of the more noteworthy ones, two, *Centromerus incultus* and *Maro sublestus*, are new to science, and are interesting additions to the number of endemic species which are already known to inhabit the fen.

Not included in any of the above totals are 4 others, which are stated to have been obtained in the fen at various times, but were not entered in my first list, because, in one instance, I was not aware of its present identity, and in the others, doubtful of the value to be attached to them. They are now inserted, with the necessary particulars, in their proper places, bringing the total for the district up to 141, a number which certainly does not yet exhaust the possibilities of the fen, for

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in addition to the commoner kinds, which may be expected to occur in their season, there is at least one other spider new to science, but its generic position is uncertain, a solitary ♀ only having been taken (June).

A morning was spent on both occasions in Edmund Fen, which adjoins the Burwell side of the 'Ten Acres,' and the following were met with in addition to the few, which are noted elsewhere :—BOTH SEXES—*Clubiona holosericea* Degeer, *C. reclusa* Camb., *C. subtilis* L. Koch, *Prosthesima latreillii* C. L. Koch, *Zora letifera* Falcr., *Antistea elegans* C. L. Koch, *Theridion bimaculatum* Linn., *Robertus lividus* Bl., *Bathyphantes pullatus* Cambr., *Agyneta conigera* Camb., *Œdothorax gibbosus* Bl., *Œ. tuberosus* Bl., *Maso gallica* Sim., *Dismodicus bifrons* Bl., *Tiso vagans* Bl., *Entelecara omissa* Camb., *Pocadicnemis pumila* Bl., *Tapinocyba subitanea* Camb., *Pachygnatha degeerii* Sund., *P. clerckii* Sund., *Pirata piraticus* Clerck, *Lycosa pullata* Clerck, *L. farrenii* Camb., *L. prativaga* C. L. Koch, *Neon valentulus* Falcr., *Sitticus caricis* Westr., *Marpessa pomatia* Westr. MALES—*Erigone atra* Bl., *Araeoncus humilis* Bl. FEMALES—*Leptyphantes ericaeus* Bl., *Gongylidiellum vivum* Camb., *G. murcidum* Sim., *Savignia frontata* Bl., *Wideria antica* Bl., *Oxyptila flexa* Camb., *O. trux* Bl., *Tibellus maritimus* Menge, *Trochosa spinipalpis* F. O. P. Cb.

Nine species of harvestmen were noted, but only one, *Oligolophus spinosus* Bosc., was of any consequence. *O. morio* Fabr., and *O. ephippiatus* C. L. Koch were found to be frequent visitors in the evenings to the lepidopterists' 'sugar' and illuminated sheets, especially the latter, roaming over them in search of the flies, etc., which settled on them.

Several mites were also secured, and for their identification I sought the assistance of Dr. George and the Rev. J. E. Hull.

ADDITIONS TO LIST.

SPIDERS.

Segestria senoculata Linn. One female on right side of fen.

Prosthesima lutetiana L. Koch. Several immature examples collected in the fen by Mr. W. Farren about 1869, and determined to be this species by M. E. Simon, ('Spiders of Dorset,' p. 463). Not noticed since. *P. latreilleii* C. L. Koch, has however occurred in an adult state. *P. lutetiana* is a very rare British spider, but widely distributed.

Clubiona brevipes Bl. An adult male from the left side of the fen.

Agroeca proxima Camb. A female from the left of the fen.

Lathys humilis Bl. An adult female beaten from the bushes on the left hand at the entrance to the fen, June, 1914.

Amaurobius fenestralis Stroem. Many examples, immature and adult, in the cracks of tree trunks in the Drive.

Argyroneta aquatica Latr. The 'Water-spider,' numerous adult females and immature examples of both sexes in the ditch by Spinny Bank; probably also in other weed-filled dikes and pits of the fen, which were not searched.

Tegenaria derhamii Scop. Outhouses at the Sycamores and at the Fen Cottage.

Cicurina cinerea Panz., sub. *Coelotes immaculatus* Camb., 'Spiders of Dorset,' p. 169. One female in the fen. This synonym, which does not appear in his 'List of British and Irish Spiders,' has been kindly communicated to me by the Rev. O. Pickard Cambridge. Not a common spider but widely distributed.

Leptyphantes pallidus Camb. One female, Lepidopterist's Drove, one male on left of fen, June, 1914. Widely distributed but not very common.

Bathyphantes gracilis Bl. Many of both sexes from various parts of the fen, and amongst heaps of sedge litter.

Centromerus expertus Camb. One male and numerous females from various parts of the fen, Lepidopterist's Drove and Edmund Fen. A female was taken in 1912 by Dr. Jackson but not recorded.

C. incultus sp. nov. An adult female, July ,1913, from the right of the fen. The example was posted to Cracow, to obtain the opinion of Professor Kulczynski, but was unfortunately lost in transit. It had, however, been seen by both the Rev. O. Pickard Cambridge and Dr. Jackson. As it will probably turn up again if looked for in autumn, I describe and figure it below.

Microneta viaria Bl. A few females from the Drove and the fen.

Micryphantes rurestris C. L. Koch. Numerous males and females from various parts of the fen and in the Drive.

M. saxatilis Bl. 4 males and 1 female, Lepidopterist's Drove.

M. mollis Camb. One male on right of fen, and several females amongst heaps of sedge litter on the Drove, July, 1913. An uncommon spider, which has been recorded for Dorset, Gloucestershire, Essex, Warwickshire and Glamorgan.

Maso sundevallii Westr. Several of both sexes from the Drove, and one male from the Drive.

Œdothorax apicatus Bl. One male from grass in the Drive. Very widely distributed, but not common.

Œ. fuscus Bl. Numerous examples, both sexes, from various parts of the fen and heaps of sedge litter.

Œ. retusus Westr. Numerous examples, both sexes. from various parts of the fen and heaps of sedge litter.

Maro sublestus sp. nov. One adult female, shaken from old bundles of *Cladium*, far back on left hand side of the fen, June, 1914. For description, etc., see below.

Erigone dentipalpis Wid. Many of both sexes from various parts of fen, the Drove and the Drive.

Erigone graminicola Sund. A female from the fen, June, 1912 (Dr. A. R. Jackson), but not determined until later.

Lophocarenum nemorale Bl. Three females from an old heap in Edmund Fen.

Cnephalocotes elegans Camb. An adult male from the left of the fen, June, 1914. Once considered a very rare spider, but recently it has been met with in several Northern localities, and in a few of them more or less freely.

Wideria melanocephala Cambr. An adult male from a heap of sedge litter in the Drove, June, 1914. A rare spider previously recorded for Dorset, the New Forest, Delamere Forest (Cheshire) and Carlow, Ireland.

Ceratinella brevipes Westr. A female from the left of the fen, and one of each sex from heaps in the Drove.

Epeira diademata Clerck. In the garden of the Sycamores.

Epeira adianta Walck. Several males and females were presented to me some years ago by Mr. F. P. Smith, for whom they were collected by an old pensioner, now dead, who stated they had been taken in Wicken fen. It is very strange, however, that such a striking spider should not have been noticed by any subsequent observer, and it is quite probable that an error has been made.

Oxyptila praticola C. L. Koch. An adult male from a heap in the Drove (June, 1914). Widely distributed in England, rare in Ireland, but not yet noted for Scotland.

Pirata hygrophilus Thor. Four females from various parts of the fen.

Salticus scenicus Clerck. Both sexes on the walls of a house in the village.

Hyctia nivoyi Luc. 'Spiders of Dorset,' p. 560; an immature female. A very unmistakeable spider, usually frequenting coast sandhills, but local in its distribution, being in England most often met with on the south coast.

(*To be continued*).

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We regret to notice the death of Mr. Joseph Horsfall Turner, of Idle, at the age of 70. In one way or another Mr. Turner has published an enormous amount of matter relating to the antiquities of Yorkshire, including a number of magazines, etc., such as 'Yorkshire Notes and Queries,' and 'The Yorkshire Genealogist.'

The Lord Mayor of Newcastle (Alderman Fitzgerald) presided at a representative meeting in Newcastle recently to consider the invitation given last year to the British Association to visit Newcastle in 1916. Principal Hadow said that if the war were not over the business would —as at the Manchester meeting this year—consist entirely of scientific papers and the interchange of scientific thought.

NATURAL HISTORY OF SAWLEY AND EAVESTONE, NEAR RIPON.

PROVERBIALLY fickle is the month of April, but the party who assembled at Ripon Station on April 24th to participate in the first excursion of the Yorkshire Naturalists' Union's programme for the present season, although naturally disappointed at the drizzling rainfall, commencing practically on their arrival, did not let it daunt their cheeriness, for there were signs that it would clear. This proved to be case about noon,

Yorkshire Naturalists near Ripon.

and although remaining dull, yet the work of the various sections was not interfered with to the extent which once appeared likely.

The area of investigation was within the Ure drainage; and comprised the townships of Sawley (except 'Sawley detached'), Eavestone, and such parts of Warsill and Bishop Thornton as lie within the Ure drainage. This area had not previously been visited by the Union, and thus an added zest was given to the excursion.

The seven miles drive from Ripon to the head of Picking Gill was through a vast pastoral plain, and proved very enjoyable. On arriving at their destination, the party had the pleasure of making the acquaintance of Mr. James Ingleby, of

Eavestone, a veteran naturalist of eighty-four years, who has kept careful records of some of the natural features of the neighbourhood. In particular he furnished notes on the district for the 'Birds of Yorkshire,' and his records of mollusca have also proved of use, and he possesses a good collection of local fossils. Mr. Ingleby proceeded with the zoologists to Eavestone and these gentlemen of the younger generation afterwards commented upon the old gentleman's remarkable vigour.

Picking Gill is a delightful sylvan valley, and although it was evident that it was too early to see the ground vegetation to perfection, yet there were many interesting phases of vegetation, while the beauty of the Gill as a whole was ample recompense for the journey. After passing through Hebden Woods, a visit was made to the Wet Carr and Mill Gill Woods, the return to headquarters (Risplith House), being through Sawley Village.

The President of the Union (Mr. Riley Fortune, F.Z.S.), occupied the chair at the meeting held at the close of the excursion, when reports upon the work accomplished were given as follows:—Vertebrate Zoology, Mr. H. B. Booth, F.Z.S.; Conchology, Mr. W. Denison Roebuck, F.L.S.; Flowering Plants, Mr. J. Hartshorn; Mosses, Mr. C. A. Cheetham; Hepatics, Mr. R. Barnes; Fungi, Mr. A. E. Peck; Lichens, Mr. W. E. L. Wattam; Geology, Mr. E. Hawkesworth. A vote of thanks to the landowners, the Marquis of Ripon, Lord Furness, Sir John N. Barran, Bart., M.P., Captain W. F. Wormald, and Captain Greenwood for the exceptional facilities given, was passed. A similar compliment was paid to Mr. Samuel Margerison. It was due to his exertions in calling attention to the attractiveness of the area, and in obtaining members of the Union to interest themselves in materials collected by him, as well as for the excellent manner in which he had carried out the local arrangements, that the excursion was so pronounced a success; and those present voiced their appreciation of his services and many courtesies, most heartily. A fair number of members prolonged their stay over the week-end, and to these Mr. Margerison read an interesting paper on 'The Natural History of the Sawley District,' which was illustrated by maps, his relief map of the district being an excellent piece of workmanship.—W. E. L. W.

Appended are the reports of the various sections.

Geology.—Mr. Edwin Hawkesworth writes:—For some unknown reason, the Geological Section was very meagrely represented, which is regrettable, as the district offered many attractions. The fine gorge of the Skell, and one or two of the smaller gills, suggested interesting glacial problems, but time did not permit of any close study of them. An instructive section in a 'gravel pit' at Clipped Thorn was examined.

This was 400-500 feet above sea-level, and appeared to be on the summit of the watershed between the Skell and Ure. The material was a dirty sand, containing large numbers of pebbles and boulders, which included many kinds of Carboniferous limestones and cherts, grits, ganisters, and Magnesian limestones. Some of the boulders were fairly big, there was no stratification visible, the included stones being scattered quite indiscriminately throughout the mass. This, coupled with the fact that many of the boulders and pebbles were well polished and striated, forced one to the conclusion that the deposit was a moraine. At Pickerstones, about 700 feet O.D., the main party saw a section of gravel. A quarry in Fountains Lane, where the 'Shell Bed,' a member of the Cayton Gill series in the Millstone Grit is exposed, was examined, and many characteristic fossils were noted.

Vertebrate Zoology.—Mr. H. B. Booth, F.Z.S. writes :—Because of the interest attached to the only really reliable habitat of the Lesser Horse-shoe Bat in Yorkshire, and this being its most northerly British record, the members of the Vertebrate Zoology Section investigated the Eavestone caves and lakes. Our guide was Mr. James Ingleby, who was chiefly responsible for having added this species to the Yorkshire fauna. A thorough search of the particular cave was made with the aid of artificial light, but, unfortunately, with a negative result. No sign of any species of Bat was visible—excepting a skeleton which Mr. Ingleby previously informed us that we should find lying on a rock inside the cave. This skeleton had almost perished and I am not certain that it belongs to a bat at all. Mr. Ingleby informed us that the end of this colony of Lesser Horse-shoe Bats had been hastened by some lads visiting the cave one Sunday afternoon, and liberating the bats in Sawley church during service the same evening. The vicar made strong representations to the local landowner, who in turn instructed his gamekeepers to bank up the small entrance to the cave, which remained so for a year or two. An adjacent and similar cave—(in which the bats might have taken refuge if they were not all fastened in)—was equally thoroughly searched, but without any success. In the opinion of those present, a certain gentleman, who was known to have occasionally visited this cave for specimens, was also partly responsible for the extermination of this isolated colony.

It is reported that this particular Bat still occurs at another place a few miles distant. We hope so, but this probably ends one of the most interesting of Yorkshire wild mammals.

Very few Squirrels were to be seen in what appeared to be almost a Squirrel's paradise. This was explained by a gamekeeper (Mr. Fearnley), that probably their decrease was due to a great abundance of Rabbits formerly, which had gnawed

at, and killed, most of the hazel bushes, thereby reducing the annual crop of nuts. But there was plenty of other food for Squirrels, and we should attribute their decrease to other causes, possibly, amongst these, to the increase of the number of males in proportion to females, as has been known to be the case with the liberated North American Grey Squirrel in this country. Rabbits were certainly anything but abundant. A huge Badger 'earth' was examined. There was good evidence to prove that the Water Vole is abundant at Eavestone Lake.

In birds the chief features noticed were three pairs of Tufted Duck on Eavestone Lake, and the number of Stock Doves evidently nesting in the cliffs surrounding the lake. The Nuthatch, a decreasing Yorkshire species, and always worth recording, had been noted by Mr. Margerison for several days in the vicinity of Risplith House. The Greater-Spotted Woodpecker was heard, and a newly-formed nesting-hole apparently of the Green Woodpecker was noted. Among other species seen were the Grey Wagtail, Dipper, Mallard, and a single Yellow-hammer (near to Sawley village). The song of the Mistle Thrush, or Stormcock, accompanied us throughout the day's excursion, no doubt as appropriately reminding us of the weather. Pheasants were numerous, and a nest containing sixteen eggs (apparently deserted) was seen. Owing to the war, no artificial rearing is to be done this season.

Perhaps Raven's Crag overlooking Eavestone Lake is worthy of passing note. It is reported to be an ancient nesting haunt of the Raven. Mr. Ingleby informed us that it was stated when he was a boy that Ravens bred there annually, until a local farmer, who had lost some lambs, offered £1 to anyone who would destroy them. In his opinion this would refer to the beginning of the nineteenth century, since when, he was certain that they had not bred there, on the evidence of old men when he was still a youth. For the date of this excursion, summer migratory birds were extremely scarce, no doubt owing to the cold unseasonable weather. Two or three Willow Warblers, a few Swallows, and a Wheatear completed the list.

In the lower vertebrates there was nothing noted of importance. Trout were much in evidence in the streams, and 'rising' in the Eavestone Lake, and the Toad was common in the lake in Picking Gill.

(*To be continued*).

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We learn from the daily press that 'ornithologists will be interested in the case of the man who, charged at Marylebone with stealing a parrot, said that he took it for a lark.'

We presume the controversy in reference to the Piltdown skull is now at an end. We notice that Dr. A. Smith Woodward and Dr. Keith are both 'hung' in the Academy this year.

———

Naturalist,

UNDESIRABLE INSECT ALIENS AT DONCASTER.

H. H. CORBETT, M.R.C.S.

On Saturday, May 8th, I was asked to visit a tannery in this town, in order to examine some damaged hides from India. The hides had evidently got damp during trans-shipment and fermentation had taken place. Those that I saw were stained almost black in parts, and there were many cracks and holes in them. On and about them were numerous insects, some dead and crushed, many alive and active. One bale had not been opened, but on thrusting one's hand into it, it was found to be very warm inside. On the following Monday I again visited the place while the bale was being opened. Here indeed was 'good hunting.' As the heated and rotten hides were lifted off, insects crawled and ran about in hundreds. I took samples of all the species that I could catch and the following list will show what was there. It will be seen that most of the species are well-known warehouse pests, but one is an addition to the Yorkshire list, and others are far from common.

EUPLEXOPTERA.

Apterygida arachides.—Mr. Porritt tells me that this species has been taken in a bone warehouse in the Isle of Sheppey, but so far as he knows not elsewhere in Britain.

ORTHOPTERA.

Phillodromia germanica.—This species was very abundant. My thanks are due to Mr. Porritt for naming these species.

COLEOPTERA.

Carpophilus mutilatus Er.—Abundant and much more active than *C. sexpustulatus.* A new West Riding record.

Laemophloeus ferrugineus Steph.—This insect was the most aboundant species and occurred literally in thousands.

Necrobia rufipes De G.—A few living, and many dead and crushed.

Alphitobius diaperinus Panz.—Abundant, more so than the following species.

Alphitobius piceus Ol.—Not so common as *A. diaperinus.* Both the Alphitobii are new records for the West Riding.

Tribolium ferrugineum F.—Abundant.

Besides these insects there were a few chelifers which I have not yet named.

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The Transactions of the Entomological Society of London, 1914, parts 3 and 4, include a paper on 'The Authorship and First Publication of the "Jurinean" Genera of *Hymenoptera*: Being a reprint of a long-lost work by Panzer, with a translation into English, and Introduction, and Bibliographical and Critical Notes.' by the Rev. F. D. Morice, M.A., and Jno. Hartley Durrant.

LEPIDOPTERA.

East Yorkshire Lepidoptera.—In the *Entomologist's Record* for April last, is a paper by Mr. A. S. Tetley, M.A., entitled, 'Lepidoptera round about Scarborough.' The lepidopterous fauna of Scarborough, has, of course, been well-known for many years, but fortunately Mr. Tetley has extended his excursions a good deal further afield, with the result that we get some very interesting records. Perhaps the most valuable is the confirmation of the old record of *Nola strigula*, which we are told still occurs in Raincliff Woods, Scarborough. This species was included in the 'List of Yorkshire Lepidoptera' in 1883, but the record seemed so doubtful that in the preface to the 'Supplement' to that List, it was included with five other species which it seemed desirable to delete. Then of *Melanargia galathea* Mr. Tetley tells us he first found the species on the Wolds near Cowlain in 1902, and that it was really abundant there in 1914. Other noteworthy records include *Lycæna agestis* which swarms on the Wolds near Pickering; *Thecla W-album*, Sleightondale, to the west of Pickering; *Nemeobius lucina*, Helmsley; *Chortobius davus*, in two places on the moors in the East Riding; *Procris statices* 'in the marshes at Seamer'; *Procris geryon*, 'common on Haugh Rigg, near Pickering'; *Chelonia plantaginis*, common on the moors of the East Riding; the three species, *Tapinostola elymi*, *Mamestra albicolon*, and *Agrotis ripæ*, all 'on a patch of sandhills some three miles south of Bridlington, where once stood the village of Auburn,' all of them as Yorkshire species only previously recorded from Spurn; *Epunda lutulenta*, on the coast; *Toxocampa pastimum*, Sledmere and Pickering; *Plusia interrogationis*, common on the moors near Ravenscar, etc.; *Scotosia undulata*, two specimens in a pine wood above Beedale. —Geo. T. Porritt, Huddersfield, May, 3rd, 1915.

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BIRDS.

Grasshopper Warbler at Mytholmroyd.—Apparently the first appearance of this species in this district occurred on a swampy piece of ground just off the main road up the Cragg valley, Mytholmroyd, on April 29th. It was seen by Mr. C. J. Dugdale, who informed me of it on May 8th, on which evening I listened to its continuous trill from 8-30 to 8-45 p.m. On the following night the bird uttered its first few notes at 8 o'clock, and a short time afterwards was in full song. I saw it several times on this occasion. It appears to spend all its time in two bushes; when flushed from the one it flew to the other, and vice versa.* Thomas Allis mentioned the

* Mr. Dugdale also informs me that he saw a tern (species ?) consorting with black headed gulls in the Calder at Greenhill, Mytholmroyd, on May 6th. This is also an unusual occurrence here.

species as frequenting Hebden Bridge in his 1844 list of Yorkshire birds, but I have never been able to trace a positive occurrence prior to the present. The attention of persons not interested in birds was arrested by the song, and there were frequently little groups of listeners gathered in the main road. The bird was still singing in the same place on May 19th. On the preceding Sunday Mr. Dugdale says it sang all day, practically continuously.—WALTER GREAVES.

Early Arrival of Swifts.—For the second year in succession Swifts have arrived in Harrogate abnormally early. This year, on the 30th April a considerable number arrived, and on the 1st of May we appeared to have our full numbers, and they were chasing each other round in small flocks, screaming in their characteristic manner, as if they had been with us for a month or more. This is only the second time that I have known them arrive in April, May 6th being their usual date.—R. FORTUNE.

——: o :——

We notice *The Yorkshire Observer* has re-commenced the 'Out of Doors' column, which appears on Friday mornings. Several Yorkshire naturalists contribute.

We see from the *Yorkshire Observer* that at the Yorkshire Assizes at Leeds, on May 5th, an action for damages for libel was brought by Lionel Walmsley against Mr. T. Sheppard, curator of the Hull Museums and joint editor of *The Naturalist*, and others. Mr. Cuthbertson was for the plaintiff and Mr. R. A. Shepherd for the defendants. Mr. Cuthbertson said that the plaintiff, who was about 22 years of age, wrote two articles, which were revised and reprinted in book form in March, 1914. Various copies of this book, which was called 'A Guide to the Geology of the Whitby District,' were sent out for review, including one to *The Naturalist*, where it was reviewed in May, 1914, and it was there stated 'During the past six years, at any rate, the author seems to have become fairly familiar with the principal memoirs dealing with the district, and in these he has deeply delved, and made tracings of the plans, sections, and fossils, etc.' This was the part of the libel which he regarded as serious. Before evidence was called the Judge suggested that this was a case in which some effort might be made to reach a settlement, and after a consultation between the parties it was agreed that the records should be withdrawn. Mr. Shepherd said that his clients had no desire at any time to harm the career of the plaintiff, and had no knowledge that the words used could do so. His clients had no intention of saying that the book was not to a very large extent original work. Of course, the plaintiff had studied the works of the people who had spent years in investigating the geology of the district, but his clients were quite prepared to say that the plaintiff's work was of good, substantial merit. Mr. Cuthbertson said his client had not brought the action to put money into his pocket, but because he thought his reputation had been attacked. Once it had been established by what Mr. Shepherd had properly said on behalf of the defendants there was no more to be said, and he was willing that the records should be withdrawn. The Judge said he was very glad that course had been taken. He was convinced of two things—that the book was of undoubted merit and contained original and useful work; and that the defendants never had any real intention or saying anything spiteful of injurious to the plaintiff.

NEWS FROM THE MAGAZINES.

Professor C. J. Patten contributes some notes on 'The Aquatic Warbler' to *The Zoologist*, for March.

The Entomologist's Record for May has an article on 'Breeding Odontopera bidentata,' by W. Bowater.

The Lancashire and Cheshire Naturalist for April contains a continuation of Dr. J. W. Ellis's 'Wirral Mycetozoa.'

The Geological Magazine for May contains a memoir and portrait of Dr. A. Strahan, under the 'Eminent Living Geologists' series.

Knowledge for May contains a well illustrated article on 'Some Notes on the Biology of the Larger British Fungi,' by Somerville Hastings.

The Belfast Museum and Art Gallery has issued its 47th publication, which deals with 'engravings' and is well illustrated. It is sold at 1d.

The Entomologist for May contains an article on 'The Rearing of Larvae' with special reference to the British Lepidoptera, by C. Rippon.

The Scottish Naturalist for May includes a note on the 'Occurrence of the Eastern Short-Toed Lark at Fair Isle: an Addition to the British Avi-fauna.'

In the May issue of *The Selbourne Magazine*, the editor informs us that originally 'an Adder' was called 'a Nadder,' and that another amphibian now called 'a Newt,' was originally termed 'an Ewt.'

No doubt owing to the war, *The Quarterly Journal of the Geological Society*, No. 280, for December, issued April 9th, 1915, is the smallest number we ever have noticed. It contains a single paper dealing with New Zealand Lavas.

From a circular issued by Mr. A. Flatters, of 16-20 Church Road, Longsight, Manchester, we gather that *The Micrologist*, the second volume of which was completed in April 1914, will be revived in October next, providing sufficient subscribers (6s. 8d. per annum) are forthcoming. Perhaps our readers who are interested will communicate with Mr. Flatters.

According to *The Daily News*, 'the butterflies of this month are very few, apart from the second-hand hibernators from last year. The green hairstreak is a surprise without a rival. Who could see an apple-green butterfly without marking it with a red letter.' To this *Punch* adds: 'This branding of butterflies, even if they are second-hand, ought to be stopped.'

Wild Life for May has four important contributions, namely, 'The Blackcocks' Tournament,' by H. B. Macpherson, 'A Critical Study of British Rats,' by F. J. Stubbs; 'The Early Breeding Habits of the Shag,' by Edmund Selous, and 'The Orange-Tip Butterfly,' by A. E. Tonge, all of which are illustrated in the remarkably fine way now expected in this interesting publication.

The New Phytologist published March 31st (the volume number, etc., etc., are much too long to quote) contains the following items: 'New Marine Fungi on Pelvetia,' 'Vegetative Production of Flattened Protonema in *Tetraphis pellucida*,' 'The Algal Vegetation of Some Ponds on the Hampstead Heath,' 'A Somerset Heath and its Bryophytic Zonation,' 'The Inter-relationships of Protista and Primitive Fungi,' etc.

From *The Haslemere Natural History Society* we have received Science Paper No. 6, 'English Science and its Literary Caricaturists in the 17th and 18th Centuries,' an address given at the 25th Anniversary of the Haslemere Natural History Society, 12th December, 1913, by Sir Archibald Geikie, O.M., K.C.B., D.C.L., F.R.S. (45 pages, price 6d.). As might be expected from anything by Sir Archibald Geikie, the address is a very fascinating one and is extremely humorous.

Some Geographical Factors in the Great War

By T. HERDMAN, M.Sc., F.G.S.

(Lecturer in Geography, Municipal Training College, Hull).

72 pages, crown 8vo, with 6 Maps, sewn in stout printed cover, 9d. net, post free 10d. net.

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YORKSHIRE'S CONTRIBUTION TO SCIENCE

(Being based upon the Presidential Address to the Yorkshire Naturalists' Union at the Leeds University)

BY THOMAS SHEPPARD
M.Sc., F.G.S., F.R.G.S., F.S.A.(SCOT.)

THIS work has been considerably extended, and occupies over 200 pages. It contains an account of the various scientific publications issued from Ackworth, Addingham, Barnsley, Ben Rhydding, Beverley, Bradford, Doncaster, Driffield, Goole, Halifax, Harrogate, Haworth, Hebden Bridge, Huddersfield, Hull, Idle, Ilkley, Keighley, Leeds, Malton, Middlesbrough, Pocklington, Pontefract, Ripon, Rotherham, Scarborough, Sedbergh, Selby, Settle, Sheffield, Wakefield, Whitby and York. In addition there is an exceptionally complete bibliography of the various natural history journals and publications now issued for the first time. The author has been successful in obtaining many publications not in the British Museum.

EXTRACT FROM PREFACE:—

IN the following pages an effort is made to indicate the various sources of information likely to be of service to a student in his work on any branch of natural science dealing with our broad-acred shire. The section arranged topographically under towns shows what has been accomplished in each place, while the remainder of the book is devoted to an enumeration of the general sources of information which should be consulted. Several of the items unfortunately are scarce, in many cases only one set being known, a circumstance which has induced me to give the bibliographical details rather fully. By a series of fortunate circumstances, and as a result of several years' collecting, I possess sets of most of the publications mentioned, and I shall endeavour to arrange that they remain intact for the benefit of future workers, as it will certainly be very difficult, if not impossible, to get such a collection together again.

It is also hoped that the bibliographical particulars of the various journals and Societies Transactions will be of service to librarians and others who often find it difficult to trace items of this character. I believe they are now given in this form for the first time.

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NOTES AND COMMENTS.

WAR NAMES.

'Why Mr. Oldfield Thomas should have applied the names of Joffre, Kitchener, and Sturdee to certain bats is,' writes a zoological correspondent, 'as incomprehensible to me as it appears to be to you. But I fancy that yet another new species—*Pipistrellus principulus*—must have been so named in honour of the German Crown Prince, for its chief characteristic is a "skull with a quite unusually swollen brain case."'

THE AGE OF OYSTERS.

On this subject Professor J. Arthur Thomson writes in *Knowledge* for June. He says: 'It is supposed by many that the age of an oyster can be ascertained by counting the rings, or groups of rings, on its deep valve, each group being regarded as a year's growth. Miss Anne L. Massy has tested this in reference to specimens from the oyster station at Ardfry, at the head of Galway Bay; but she does not recommend the method. "All I can honestly say I have learnt from a patient scrutiny of over six hundred samples of various ages, from eighteen months to six years, is that an oyster of eighteen months or two summers appears to possess at least two rings, but may have as many as five. One of three summers has at least two rings, and may have six. A four-year-old oyster may have only three rings, or may possess seven or eight."'

WINKLES AND FISH *v.* LAW.

We learn from the *Yorkshire Observer* that the High Court of Justice has decided unanimously that a winkle is a fish. The case was an appeal against a conviction under the Larceny Act of 1891, which Act imposes a penalty on any person who takes or destroys any fish in any water which is controlled by private fishery rights. The appellant had been found picking up winkles on mud-flats in a tidal river, and the point submitted to the Court was whether winkles were fish or not. The Lord Chief Justice confessed that he would have been puzzled how to decide had he not found guidance in a former judgment to the effect that crayfish were fish, and he quoted this interesting declaration of Mr. Justice Mathew: 'It is perhaps, difficult to give any definite reason except that crayfish are fish.' This, said the Lord Chief Justice, 'was a decision which they must follow.' Mr. Justice Avory agreed, adding that but for the precedent he would have decided otherwise, and Mr. Justice Low superciliously declared that he 'saw no reason why a winkle should not be a fish.' To the lay mind it does not seem a necessary conclusion that a winkle must be a fish because a crayfish has been held to be one, but legal logic follows rules of its own. 'The Standard Dictionary' defines a fish as (1) a vertebrate animal with gills, and (2) an animal

habitually living in the water. Neither crayfish nor winkles come in under the first definition ; crayfish certainly do under the second. But can winkles be said to live habitually in the water ? The same authority describes a winkle as a ' large spiral gastropod,' but makes no mention of its habitat. A gastropod is an animal which has a foot attached to its ventral surface, and the order includes all slugs and snails, but has no kinship either with fish or crayfish. Are our garden snails now to be regarded as fish within the meaning of the Larcency Act ?

THE LAW AND PRAWNS.

Following on the above case we learn from the daily press : ' Is a prawn a fish ? This was the question debated at the Eastbourne Borough Bench recently. Richard Barrett, of Eastbourne, was summoned for hawking fish on the parade on 14th May, and denied the offence. P.S. Holden deposed that defendant shouted " Fine large prawns," and called at several houses. He told witness he was on his way home. Defendant : A prawn is not a fish. Mr. E. O. Langham (Magistrates' Clerk) : Yes, it is. What do you call it—a bird ? Defendant : No ; it's an animal. Mr. Langham : It is a crustaceous fish. Defendant : No, it is not. Barrett, leaving this point, denied that he was hawking. He had to pay a fine of 2s. 6d.' Apparently up-to-date legal classification is after the style of the well-known railway porter's classification in *Punch*, many years ago : ' Cats is dogs and monkeys is dogs, but a tortoise is a hinseck.'

THE VASCULUM.

We have received the first part of an ' Illustrated Quarterly dealing primarily with the Natural History of Northumberland and Durham and the tracts immediately adjacent,' which is edited by J. E. Hull, Richard S. Bagnall, George Bolam, and J. W. H. Harrison (32 pages, 1s. net). There is an ornamented cover with the names of many leading northern naturalists. Mr. Bolam writes on ' Newts,' Mr. C. E. Robson on ' The Hancock Prize,' Mr. J. W. H. Harrison on ' Root Parasites,' Mr. H. Preston on ' The Black Hall Rocks,' Mr. R. S. Bagnall on ' A New Species of Neuroptera from the North of England ' ; and there are shorter notes and records, and particulars of a competition for young people. We hope there will be sufficient enthusiasm among our friends in Northumberland and Durham to keep the journal going.

BRITISH AND GERMAN STEEL METALLURGY.

In a pamphlet with the above title, written by Professor J. O. Arnold, F.R.S., of the Sheffield University, published as one of the Oxford pamphlets (2d.) it is shown (1) that German steel metallurgy owes far more to British inventors than

British steel metallurgy owes to German inventors, and (2) that the steel department of the University of Sheffield has done work greatly superior to that of the corresponding department at Charlottenburg. The following is the claim bearing on the latter thesis:—'There are about twenty-nine constituents or sub-constituents of steel and iron. Of these, twenty-six have been discovered in Sheffield, the steelopolis of Great Britain; three in Middlesbrough, its ironopolis; and the record of Charlottenburg in this branch of research is absolutely blank.'

THE 'IDEAL CURATOR.'

Different people have different ideas as to the duties and accomplishments of Museum Curators. We know of several 'ideal curators,' but the writer of the following paragraph taken from the daily press, has evidently peculiar views as to a curator's duties:—'In George IV.'s wardrobe were found many things that could not be offered for sale—countless bundles of women's love letters, women's gloves, and locks of women's hair. These were destroyed. And five hundred pocket-books came to light, all containing sums of money, £10,000 in all was thus collected. For the King was a great hoarder and yet systematic in his hoarding. He carried the catalogue of his wardrobe in his head, and could, it is said, call for anything at any moment. He would have made an ideal curator of a museum.'

BRITISH ASSOCIATION.

We should like to congratulate the Secretary of the British Association on the fact that the annual reports are now being issued a little more promptly. In the past we have been given to understand that it was impossible for the report of one meeting to be issued much before the eve of the next; impossible or not, the reports now appear earlier than they did. The report of the 1914 meeting, notwithstanding the fact that it was held in Australia, was received by us on June 4th. We shall still hope that the day will come when the report is issued during the same year as the meeting.

SECTIONS OF COAL STRATA.

From the Midland Institute of Mining, Sheffield, has been issued two valuable volumes, the first being entitled 'Sections of Strata of the Coal Measures of Yorkshure, together with a few Derbyshire Sections, compiled from Records of Borings and Sinkings' (303 pages, royal 8vo), and the second, 'Cross Country Sections and Map of Yorkshire Coalfield.' The sections were prepared by Messrs. W. H. Chambers, H. St. John Durnford, John Gerrard, Prof. F. W. Hardwick, W. Hargreaves, W. H. Humble, T. W. H. Mitchell, J. Nevin,

Prof. L. T. O'Shea, E. W. Thirkell, G. Blake Walker, W. Wilde and J. R. R. Wilson. The late John Nevin acted as Chairman of the Committee for several years, and the collection was largely due to his initiative. It contains details of the various borings in the numerous Yorkshire collieries.

SINKER'S TERMS.

There is a general introduction and a glossary of Sinker's terms, many of which are somewhat unusual, namely :— Blaes and Balls, Black Bat, Blue Bind, Cank, Clod, Clunch, Conny, Corrity Stone Bind, Fakes, Fakey Blaes, Greydogs, Mingy, Rattle Kack, Skerry, Slum or Sloom, Smuts or Smut, Soapy Blaes, Spavin and Spire. Those concerned in the thickness and depth of the various old rocks of the county will find some useful information in this volume. The second includes a map of the coalfield showing the position of the various colleries, and lines of two sections, which are given in detail in the same cover. One is from Burnley to Pontefract, and the other from Manchester to Doncaster.

THE CROSSLAND COLLECTION OF FUNGI.

We see from the *Kew Bulletin* an interesting announcement, to which we have already briefly referred in these pages :— " A valuable addition to the already extensive mycological collection in the herbarium has been made through the purchase of the series of drawings and specimens of British fungi belonging to Mr. C. Crossland, of Halifax. The drawings, representing 543 species, mostly Discomycetes, are especially welcome. There is a coloured representation of each species, natural size, accompanied by sections, dissections and spore measurements ; also a detailed description, critical notes, etc., and in each instance by the specimens from which the figures and descriptions were drawn. The general collection of fungi, numbering 2,000 species, is in an excellent state of preservation, and embraces representatives of every group of British fungi. There are also some 84 Myxomycetes.'

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The *Report of the Library and Museum at Bootle* shows that the museum still continues its useful educational work in that town.

Belfast Museum Publication, No. 49, deals with ' The House Fly and Disease,' and is illustrated. It is written by the Curator, Mr. A. Deane.

The *Colchester Museum* has issued its report for the past year (32 pages, 2d.), and, as usual, it contains particulars of an enormous number of valuable additions. There are illustrations of some recent antiquities.

The 44th Report of the Rochdale Public Libraries, Art Gallery and Museum Committee contains a portrait of the late Col. Fishwick, F.S.A., as well as particulars of additions during the year, of the lectures given, etc.

OBSERVATIONS ON THE GREY SEAL.

EDMUND SELOUS.

Oct. 11th, 1914.—Yesterday, in company with my friend, Dr. Heatherley (to whom as its originator, the credit of the expedition, with all that came of it, wholly belongs), I arrived at St. Mary's, the pleasant little capital of the Scilly Isles, and, this evening, we set sail in a small, open yacht, with the view of making, through the medium of observation and photography, some addition to the present knowledge of the Grey Seal (*Halichærus grypus*, as I understand). Mr. King, who resides in the town, and whose sea-bird and seascape photography is well-known, came with us, as also his son. It being now the childing time, young Seals of this species (for the Common Seal, oddly enough, is not found here) were to be expected on some or other of the more promising outlying islets. On the first of these that a long course of slaughterous experience (now happily over) suggested to our skipper, we found two lying on the rocks, but the difficulty, in the event of the sea rising, both of getting a boat in and getting into it from the rocks, was decisive against our being left here. After a good deal of coasting to no purpose, we were again successful with another small fragment of territory, formed, for the most part, of more or less rounded masses of granite, varying in size from pebbles to blocks of titanic magnitude, and alternately rising into pinnacles and sinking into beaches or, more frequently, rocky foreshores.

Here again we found two quite young Seals, each in its own bay or cove, and—a point to be remembered—entirely cut off from each other. As the conditions for landing and return were more generally favourable here, the tent was put up (leaving the shed for to-morrow) and, about five, my friends put off to the yacht.

Only a few minutes after I had been left alone—probably before the boat had reached the yacht—a female Seal (as was soon made evident) came close into the shore, and, in another few, began to ascend the rocky pathway—by which I mean the least steep or least resistance-offering, or most direct line—towards her calf, who, ever since our landing (between 1 and 2 perhaps—it was now about 5 p.m.), had lain in the same place, almost without moving. He* now began to move, to meet his dam, each of them pausing, at intervals, to rest from the exertion of jerking themselves along. At a certain point—halfway, perhaps, between the sea and her young one—the old

* I never knew the sex of any of these young Seals, and only use the personal pronoun when wishing to avoid the 'it.'

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Seal halted more definitely, and, stretching herself luxuriously on her side, waited whilst it continued its little forced marches towards her, evidently (the calf I mean) in a state of anticipation. The exigences of the rocks however, prevented his getting quite comfortably at her dugs, and in this she had to help him by sundry large motions and shiftings of position. I saw the whole expanse of her conspicuously marked belly, which, as I had before remarked in the Shetlands, can present a most handsome appearance in the water. The calf sucked first one and then another of her two tits (after observation showed that there were no more, though at first, I thought four was the number), situated one on either side of the median line, in about the same relative position as those of a dog or cat, but with a broader space between them, answering to the portly size of the great belly. Whilst the calf was engaged with the under one, I could often see the milk exude from the one above it, and trickle down past his muzzle. At intervals he butted the udder, with his nose, as a lamb does, but not so quickly, nor, as it struck me, so violently. The repast seemed to me (for I had no watch) to last five minutes, but it may have been ten, after which time, the mother, before the calf had finished, jerked herself away and retreated into the water. The young one followed her, but I did not see it enter the sea, as, just at its edge, a rock was in the way. After waiting some little while, and seeing no more of either of them, I concluded that both had swum away together. At any rate, the incident which I have narrated was now closed, so crawling out of the tent, over the rocky ridge of the island, immediately behind it, I walked, under cover, to a niche in the rocks commanding an unseen view of where another, a full-grown Seal had for some while been lying —this, too, a female and mother. She was still there, and motionless as ever except when the tide, which was now coming in, just touched her nose, at intervals, through a larger wave, on which she threw up her head protestingly, for a moment, like a heavy sleeper informed that breakfast is ready. After awhile, and before she was in any immediate danger of being floated off, she aroused herself, but instead of entering the sea as I had expected, began to climb further up the rock. This she continued steadily to do, in spite of the roughness and difficulty of the ascent, till, all at once, a young Seal, till now hidden, came into sight, shuffling down the rock to meet its mother. But although the two were soon almost together, the difficulties for the calf were so great that it had to ascend a different rock from the one she was on, thus travelling away from her, on which she jerked herself quite round, and at the same time up this one, tail foremost, and on her side, as it seemed to me, all the time, and so presented her dugs to the calf in the same way that the other had done. Doubtless all

now went forward as before, but it had become too dark for me to follow it, and, short as the distance was, I thought I had better make sure of the way back to my tent. This I did, and then returned again. I could just see that the old Seal and her calf were lying in the same juxtaposition towards one another as I had left them in, though, as I should suppose, the latter would, long ere now, have had all the nourishment it required. I then left them again for my tent, and after some rude eating (the sweeter for being so), turned in.

To the above I have to add that, whilst the mother Seal was lying on the rock, and had not yet begun her further ascent, another full-grown one had, several times, appeared just under the shore, floating upright, for the most part, in the water, with his head held high out of it and flung right back. He often shook it, with his whole throat, and whether doing so or not, often kept his jaws wide open. I assumed that this was the male, and husband of the alma mater on the rocks, as also that a complaining cry, as it sounded, having a wonderfully human intonation, which came, first at intervals, and latterly, almost continuously, proceeded from him. This, however, as will appear, by my next entry, was probably a mistake.

Oct. 12th.—The sound that I yesterday attributed to the male Seal I have now heard made several times by the last-fed calf, at close quarters, so that I feel pretty sure it was it that so cried to be fed, and not the male. Also both since then, as well as formerly in the Shetlands, I have seen these Grey Seals holding their heads thus straight out of the water and opening their mouths, at intervals, without uttering any sound. Early in the morning of this day I saw from my tent two grown Seals—I think a male and female—constantly swimming and 'peg topping' (as I have elsewhere called it, floating, that is to say, perpendicularly) in the water, close to the shore of the little bay or nook where I saw the first young Seal fed, and, after awhile, I saw this same young Seal (as I make no doubt it was) go up out of the sea on to the rocks again. I could only see it, for a little, however; the rocks soon hid it, and one was just in front of where it at last settled down though I could sometimes see the end of its outstretched flipper above it. Probably it lay on its back, which, I find, is a favourite attitude with these young Grey Seals, as it is with the full-grown Common one. I fancy it is less so with the species in question, but must look up my 'Bird Watcher in the Shetlands' again to be sure of this.

Dr. Heatherley, with Mr. King and his son, turned up from the yacht about 11 a.m., with the different parts of a wooden shed, to put together, upon the rocks, for the purposes of photography. On repairing to the place where I had yesterday watched the suckling of a young Seal, there was now, besides

this one, another lying on the rocks, considerably smaller, and which, by all the signs—umbilical cord, blood close by, etc.—could not have been born above an hour or so ago. It could, therefore, have had no previous experience of mankind, and I particularly noted (wishing to test the matter) that it moved its head towards my hand and even made immature snaps at it, when I touched it on the body, thereby proving that distrust of, and hostility to humanity must be instinctive in this Seal, and not either taught it by its mother, or gained through individual experience. This fact is interesting and I do not see how it could be better proved. Now how did this fear of man, or of enemies in which man is included, come into the possession of our newly born Seal? Must it not have been through a long road of previous individual experiences, each one of which marked a mental impression (having its physiological analogue) on the brain? If so, were not such impressions acquired characters? These actions of the baby Seal were not like mere general response to stimulus. Though weak, and, as it were, clouded through its own weakness and immaturity, yet one got clearly that suggestion of intent and individuality which would appeal to a sportsman as viciousness. I find it difficult to believe that such characterised movements can be due to a process of natural selection, with which impressions gained through the senses in their re-actions to the external world had nothing to do, as being brought to bear on the non-somatic cells only. In two other young Seals whose acquaintance I made on the way here, on an island too exposed to heavy seas to make it advisable to stay there, and who might have looked upon the world for a full week or ten days perhaps, the hostility referred to was more developed, having the greater vigour of their greater age.

The shed was put up upon a high-standing, flat-topped rock which just accommodated it, and stood just between a little sea-pool, either left or sprayed up by the tide, in which the elder young Seal was now domiciled, and the newly-born one on the rocks about twelve paces off. No mother came out upon the rocks for about two hours, as I should conjecture, after the party had gone. Both the young seals cried, the younger one more weakly and sharply than the other. It is difficult to find a special word for this sound, neither bellow, bleat, nor low suiting it. It is more like a moaning, the intonation being very human, and often resembles—to the extent, indeed, of being most painful to hear—the bitter crying of a child. For this description, however, to be fully justified, the desire of the calf for nourishment must be acute, and its age, as I should think, at least a week.

After the two hours or so I have conjectured, a grown female Seal swam right into the shore, and began to ascend the

rocks. It soon appeared that she was the mother of the newly-born one, as she came and lay upon the rock next to the one on which the latter lay. Strictly speaking, indeed, the two were one, but separated by a complete split or fissure which continued through the greater part of their length. To get upwards to the joined part, and then down on the other side, involved much more climbing than I should have thought the little thing had been equal to, but he accomplished it, after several near-tumblings, in a surprising way. The mother lay entirely on her side, but unfortunately this time, her back was turned to me, which quite hid the young one, from the time it got into proper position. After about the same space of time as on the first occasion of my witnessing this scene, the mother moved off into the sea again, and the young one settled down to sleep on the rock where he had been suckled. As for the other young Seal, if he was fed at all, it must have been after dark when I could have no longer distinguished anything, and in consequence, had given up watching. His cries during all this while were most distressing. They continued to be so for some time after I had lain down, but there came a point when they grew less, and then ceased, which leads me to cherish the hope that he was fed by his more suspicious parent during the night, and as he has now, for a long time, since morning, been silent, there may have been a time when, after much watching from night into day, this may have happened again, after I dozed off.

(*To be continued*).

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The Scottish Naturalist for June contains a paper on 'Scottish Hair-worms (*Nematomorphia, Gordiidae*), their Occurrence, Habits and Characteristics: with a key for the Discrimination of the species recorded from Britain,' by James Ritchie.

In *Wild Life* for June are two papers on 'The Woodlark,' by W. Farren, and E. E. Pettitt respectively; 'The Shoveller,' by M. Portal; 'The Shag,' by Edmund Selous, and 'The Yellow Necked Mouse,' by Miss F. Pitt. All are well illustrated, as usual.

The Zoologist for June includes an article on 'A Variety of Water-Shrew' which is almost white, and is presumably from Nottingham. The same journal contains a sketch of some curious abnormal hands of crabs, and there is an illustrated account of some star fishes feeding upon a pipe-fish.

The New Phytologist published June 7th (the reference as given is far too long to quote) includes papers on: 'Structure and Development of *Targionia hypophylla*,' by Lillian O'Keeffe; 'Further Observations on the Heath Association on Hindhead Common,' by F. E. Fritsch and E. J. Salisbury; 'The Australian Meeting of the British Association,' by E. N. Thomas; 'Foreign Pollen in the Ovules of *Ginkgo* and of Fossil Plants,' by Birbal Sahni; 'A Disease of Plantation Rubber caused by *Ustulina zonata*,' by F. T. Brooks, and 'The Inter-relationships of Protista and Primitive Fungi,' by F. Cavers.

MYCOLOGICAL NOTES FROM SCARBOROUGH.

A. E. PECK.

THE Mycological Committee of the Yorkshire Naturalists' Union held its spring meeting from May 29th to June 1st, with headquarters at the Forge Valley Hotel, West Ayton. Permission to visit their respective estates had been kindly granted by Lord Londesborough and Lord Downe.

Messrs. Harold Wager, F.R.S. (Chairman), Alfred Clarke, T. B. Roe, and A. E. Peck (Secretary), members of the Committee, and Mr. R. Fowler Jones, made some excellent records, although investigations were limited to Yedmandale, Forge Valley, and a part of Raincliffe Woods bordering on Lady Edith's Drive.

The ground covered may be considered 'classical' from the Mycological standpoint, as it was here that Mr. George Massee worked for so many years, his many notable records being duly set out in the 'Yorkshire Fungus Flora.' Here were met with many of the original specimens upon which new species were founded, and some of the figures illustrated in Dr. M. C. Cooke's book were the result of Mr. Massee's industry in this locality. The local records have been somewhat increased by Mr. T. B. Roe and the writer.

In Forge Valley were found two specimens of the Morel (*Morchella esculenta*) and the writer gathered a dozen specimens at the same spot a fortnight earlier. He then had also observed *Mitrophora semilibera* and *M. gigas*, two species closely related to the Morel.

In all seventy-eight species and one variety were met with, the following being of chief interest and importance :—

† *Thelebolus terrestris* (A. & S.) Tode.
† *Pleurotus salignus* Pers.
Puccinia chrysosplenii Grev.
† *Cordyceps capitata* Fr.
Xylaria corniformis Fr.
Hypoxylon marginatum Berk.
* *Gorgoniceps guernisaci* Sacc. var. *leptospora* Mass. = *Vibrissea guernisaci* Crouan var. *leptospora* Mass.
Peziza reticulata Grev.
* *Humaria pilifera* Sacc.
Ombrophila clavus Cke.

The following are of special note :—

Gorgoniceps guernisaci Sacc. var *leptospora* Mass. (= *Vibrissea guernisaci* Crouan var. *leptospora* Mass.)—This, which is new to Yorkshire, Mr. Wager found in Forge Valley in a wet place on a fallen branch of a wild rose. It is a small discomycete with a yellowish disc and a dark olive exterior. On being held up in a window of the hotel in the sunlight, the elongated spores were seen to be waving about on the disc in a vibril manner, collectively appearing like strands of shining

* New to Yorkshire. † New to Vice-County, N.E.

flossy silk. These were quite easily detached and removed to a slide, and proved to be most interesting objects under the microscope.

Cordyceps capitata Fr., a very rare species, was found by Mr. Wager and Mr. Peck in a meadow on the border of a wood in Yedmandale. This pyrenomycete is parasitic on *Elaphomyces granulatus* Fr., a subterranean species. Search was afterwards made for the host, but without success, as it was difficult to locate the exact spot where the Cordyceps had been collected. This species was found by Bolton in 1786 in Ramsden Wood,

Cordyceps capitata. ¾ and life size.

Halifax. Sowerby (1803) says : ' I have only seen one specimen of this fungus, for which I am obliged to the Rev. Mr. Francis, whose lady found it at Holt, in Norfolk.'

It is the largest Cordyceps the members present had seen. Cooke's description is ' Fleshy, head ovato-globose, bay-brown ; stem yellow, then blackish ; sporidia colourless, jointed, the joints rod-shaped or cylindrical, joints of sporidia (.0003 in.) .0076 mm. long.' Fries says, ' Often tufted ; stem 1-4 in. high, 2-4 lines thick, equal, smooth, lemon-coloured, at length fibroso-strigose and blackish. The colour of the head borders on yellow, red-brown, and black ' (Cooke's Handbook Brit. Fungi, page 771).

Humaria pilifera Sacc. New to Yorks. This very beautiful species was found by Messrs. Wager and Peck. It is a small orange-red discomycete occurring on sandy soil. The margin and exterior of the ascophore are minutely fimbriate. The clavate paraphyses are remarkably beautiful, being filled with orange oil globules at the apex, these giving the characteristic colouration to the disc.

Mr. Clarke subsequently circulated to members from his portfolios, drawings and notes on *Cordyceps capitata* made respectively by Bolton (1786) and Sowerby (1803).

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Wonders of Wild Nature. By **Richard Kearton, F.Z.S.** Cassell & Co., Ltd., 1915, 174 pages, 6s. The house of Cassell has issued a number of volumes under the name of Kearton, and these have usually been exceedingly attractive from the fact that they have been well illustrated. The present volume contains photographs taken by Richard Kearton and his daughter Grace. It includes chapters on 'Wild Life Round London,' 'Wild Life of Lonely Isles,' 'Bird Life on the Polders and Meers of Holland,' and 'Wild Life on the Norwegian Mountains.' Many of the photographs are of great interest and there are some illustrations in colours. It is a very attractive volume.

Whitby Wild Flowers. By **Bernard Reynolds.** Whitby: Horne & Son, 1915, pp. 60, 1s. net. This list of Whitby plants is intended to replace that by J. Swales in the 'Guide to Whitby.' It is much fuller and better than most lists in guide books, and includes not only the district of Whitby, but also Levisham and Scarborough. The Latin names we are told are those of Babington's Manual, 9th edition, but unlike the latter work, the author is very erratic in his use of capitals for specific names. More than half the book is devoted to notes on the plants, and these add greatly to the value and interest of the work. In this section are contributions by Mr. F. Arnold Lees, Rev. E. A. Woodruffe Peacock and Mr. J. Foggitt. The localities of the more interesting species are described in accounts of six excursions, in one of which a reference to *Cyprepedium* requires considerable revision. The work concludes with 'Floral Notes' extracted from the contributions of the late John Swales. In a short bibliography a list is given of some of the chief Yorkshire floras, in which the author misquotes and apparently misunderstands Davis & Lees' West Yorkshire.

The Families of British Flowering Plants. By **W. B. Grove, M.A.** Longmans, pp. vi. + 49. 1s. net. This little work reminds us, were that necessary, that the 'old order changeth.' The system of Bentham and Hooker, which has so long served British botanists, is slowly but surely giving place to the more natural system of Engler. This is the natural result of scientific progress, and the time now seems ripe for the change, though doubtless many present-day botanists will still cling to the more familiar system. The families, i.e., the natural orders of British floras, are arranged on Engler's system, with several slight modifications, and the author adopts from Moss's British Flora the group names Amentiflorae, Petaloideae, Centrospermal and Heterochlamydeae. The characters of each family are in most cases fully given, together with a list of British genera, and also the more interesting foreign genera which students should be familiar with, or are met with frequently in cultivation. The synopsis is well arranged and clearly printed, though some of the contractions are at first a little puzzling. It will form a handy guide to students working at systematic botany, and doubtless will become of general use in the determination of the main groups of flowering plants.

THE SPIDERS OF WICKEN, WITH DESCRIPTION OF TWO NEW SPECIES.

WM. FALCONER,
Slaithwaite, Huddersfield.

(*Continued from page 204*).

HARVESTMEN.

Liobunum rotundum Latr. Several examples, the Drove, and in the garden of the Sycamores.

Phalangium parietinum Degeer. Several from the fen, an outhouse in the village, and at the Sycamores.

P. saxatile C. Koch. The fen, Edmund Fen, and Sycamores.

Platybunus corniger Herm. The fen, the Drove and the Drive.

Oligolophus morio Fabr. Bushes at the entrance, and in many parts of the fen and the Drive. Plentiful also in Edmund Fen.

O. agrestis Meade. Several examples near the fen.

O. ephippiatus C. Koch. Numerous in various parts of the fen, and less so in the Drive.

O. spinosus Bosc. Several examples beaten from borders of box in the garden of the Sycamores. Apparently a local species, not yet found north of Leicester. In addition to places in the South of England, from which it has already been recorded, I have had examples from Cheltenham (Mr. W. P. Winter), and have collected it at Eastbourne.

Nemastoma lugubre Müll. Various parts of the fen, the Drove and Edmund Fen.

MITES.

Anystis baccarum Linn. Common in various parts of the fen.

Oribates setosus C. L. Koch. Several from newly cut grass in the Drove.

Bdella vulgaris Herm. One from the Drove.

Johnstoniana errans Jhnstn. Numerous all over the fen, and less so in Edmund Fen.

Trombidium (*Ottonia*) *sheppardii* George. A few from both sides of fen.

T. purpureum Koch.* One juvenile=*Ottonia bullata* George, Edmund Fen.

T. pexatum Koch* (*Ottonia conifera* George). One example. Edmund Fen.

Erythræus hirsutus George. One from left side of fen.

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* These synonyms are given on the authority of the Rev. J. E. Hull.

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Erythræus nemorum Moch. Several examples from various parts of fen.

Gamasus crassipes L. Abundant in the fen.

Cyrtolælaps nemorensis Koch. One example from each side of fen.

DESCRIPTION OF NEW SPECIES.

CENTROMERUS INCULTUS Sp. nov.

(Figs. 1, 2, 3).

Adult female, 1·9 mm.

This little spider is similar in general appearance and structure to other smaller members of the same genus, but is—although different individuals of the latter (especially in *C. arcanus* Cambr., in which the male is also always larger than the female, an unusual circumstance amongst spiders) vary in point of size and depth of colour—distinctly smaller, and of a somewhat different coloration, the whole body being dull yellowish brown, suffused with blackish brown on the abdomen, cephalothorax and legs. Its mouth parts, eyes (fig. 2), and sternum (fig 1) conform to type and present no exceptional features.

Its epigyne is of the same type as that of *C. arcanus* Camb., and at first sight appears very similar, but comparison of the various details shows that it is quite distinct from it, and characteristic. In both species this organ is of rather complex structure, but on reference to the drawing of that of *C. incultus* (fig. 3), it will be seen that the distinctive central longitudinal ligulate process is much broader and shorter and extends very little beyond the posterior level of the rest of the epigyne, while the corresponding process in *C. arcanus* Cambr. (fig 4), is not only much longer and narrower, but projects a considerable distance backwards. There are other obvious differences which together with its smaller size and different colouration, will render the identification of the present species easy.

I am indebted to the Rev. O. Pickard Cambridge for drawings from which figs. 1, 2, 3 were prepared.

MARO SUBLESTUS Sp. nov.

(Figs. 5, 6, 7, 8, 9, 10).

Adult female, 1·3 mm.

Cephalothorax, Maxillae, Falces and Legs of a general yellowish brown colour, the first-named with the darker markings specified below. Pubescence sparse.

CEPHALOTHORAX (fig. 5) much longer than wide, oblong oval, narrowed a little forward from the level of the

coxae of legs I, rounded in front and truncate behind. The *profile line* curves gently upwards behind the ocular area, and is then fairly level to the thoracic junction, just beyond which the *posterior slope* is rather abrupt, and somewhat excavated. The *thoracic sutures* and other grooves are marked on their lower parts by uneven dusky lines, which converge towards the thoracic junction, just in front of which, centrally placed, is a large, irregular-edged, dark *marking*, rounded behind and transversely nearly straight in front, close to which two round yellowish brown spots are visible; each of its *anterior external angles* is prolonged to just behind the posterior lateral eye on the same side by a slender outwardly curved line. At the beginning of this marking, and also immediately behind it, are slight dips in the profile line. *Lateral and posterior marginal lines* black and uneven, the former disappearing forward.

CAPUT well marked, somewhat convex behind the ocular area, which occupies the whole width of the upper front.

EYES (figs. 5 and 8).—Eight, in two rows, moderately large and closely grouped; the anterior centrals alone dark-coloured, the rest pearly white.

POSTERIOR EYES on black spots, subequal in size and arranged in a shallow backward curve. Centrals separated by about a diameter, and distinctly nearer to the adjacent lateral than to each other.

ANTERIOR EYES, their whole area suffused blackish, almost in contact and with the laterals of the posterior row forming a strong curve forward. The laterals are a little the largest and the centrals much the smallest of the eight eyes.

LATERAL EYES on each side in contact, and situated on a low oblique prominence.

CENTRAL EYE SPACE longer than wide, and much narrower in front than behind.

CLYPEUS low, about as high as the ocular area, depressed below the eyes and slightly projecting at lower edge.

FALCES fairly long and stout, straight, vertical, conical, and finely transversely striate on outer margin. *Fang*, slender, long and tapering; *upper fang groove* with 4 short conical yellowish-brown teeth (fig. 7), the first three contiguous at base and increasing in size outwards to the third, which is the largest; the fourth a little removed, and a little smaller than the third; *lower fang groove* with 4 very minute, granular teeth.

MAXILLAE moderately long and strong, oblong, inclined to labium, the internal margin a little bent. The outer

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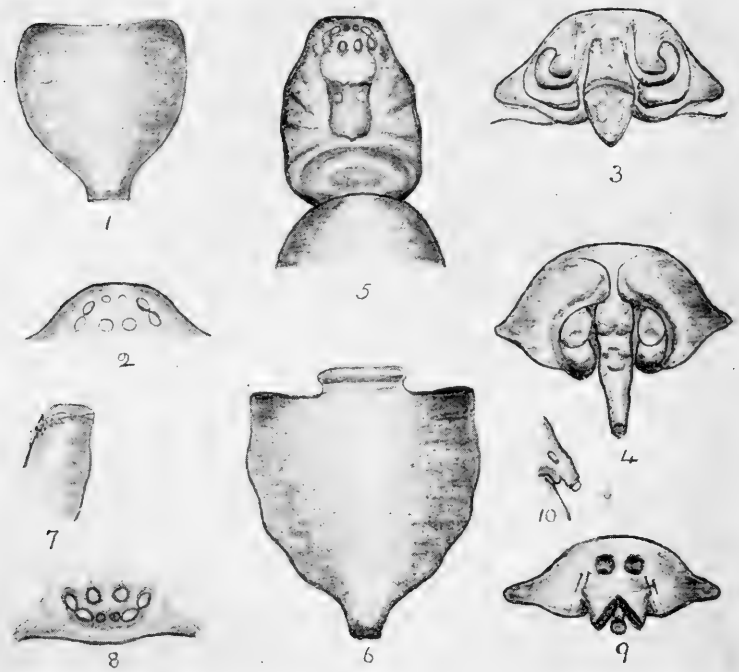
margin with 3 or 4 strong, black, curved, bristly hairs, followed nearer apex by a short dark, distinct serrula; a few scattered hairs on the other surfaces.

LABIUM (fig. 6), dull dark brown, very wide and short, blunt and rounded at extremity, deeply transversely impressed across the middle.

STERNUM (fig. 6), large, shield-shaped, width and length about equal, squarely truncate in front, and produced



Centromerus incultus sp. nov. ♀.
Fig. 1. Sternum.
Fig. 2. Eyes from above and behind.
Fig. 3. Epigyne.

Centromerus arcanus Cambr.
Fig. 4. Epigyne of female.

Maro sublestus sp. nov. ♀.
Fig. 5. Cephalothorax from above.
Fig. 6. Sternum and labium.
Fig. 7. Teeth of the upper fang groove.
Fig. 8. Eyes from in front.
Fig. 9. Epigyne from below.
Fig. 10. Epigyne from the side.

backward between the posterior coxæ in a downward inclined process with slightly converging sides, and of rather less width than coxæ IV.; dusky brown with small

round yellowish brown spots of varying size freely scattered over its somewhat convex surface; a distinct but slender black *marginal line*. *Hairs* few, scattered.

PALPUS without a terminal claw. *Femur* long, slender, bowed, slightly enlarged towards distal end. *Patella* almost nodiform, with a long erect bristle at extremity. *Tibia* short, gradually enlarged upwards from base. *Tarsus* provided with hairs and a few long slender black spines, acuminate and nearly one and a half times as long as the tibia.

LEGS damaged, order of length apparently 4, 1, 2, 3, fairly long and strong and well supplied with black hairs, arranged on some of the joints in definite rows and mostly seated on black, slightly raised bases; this arrangement most noticeable on the tarsi and in a less degree on the metatarsi.

TIBIAE with a long erect slender black spine, much exceeding the diameter of the joint on the dorsal surface near the base. Tibia IV. also with a long dorsal acoustic seta near the distal end.

PATELLAE with a similar spine at extremity.

TARSI very little shorter than the metatarsi, but distinctly so in leg IV., slightly tapering. *Claws* small and slender.

ABDOMEN oblong oval, widest in posterior half, rounded before and behind, projecting a little over the cephalothorax; sparsely provided with black hairs, and with a patch of longer, stronger, more bristle-like, upcurved hairs at the fore extremity, springing from black, slightly raised bases. Dull yellow-brown in colour, suffused thinly all over with a dusky tinge, through which show a number of roundish spots similar to those on the sternum, but varying more in size, and more irregularly disposed; some of these on the under surface become partly confluent, and form two more or less continuous lines, one on each side of the median line. About the spinners are a number of minute black spots mostly arranged in diverging rows along the edges of paler lines.

SPINNERS short, stout, conical, truncate, converging towards summits. At the point of junction of each of the lower pair with the abdomen is a semicircle of 3 or 4 evenly separated, distinct, small round black spots, from two of which fine straight lines of the same colour pass upwards to two similar spots quite half way up the spinners.

EPIGYNAL AREA yellowish brown, suffused in parts. *Epigyne* (figs. 9 and 10) raised and projecting; on the *posterior margin* two conspicuous narrow reddish-brown, oblong, convex tubercles, converging forward to form an

inverted ∧; nearly filling up the space between them, a very pale round-headed process; on the *anterior part* two large round dark-coloured spermathecæ separated by less than the diameter of one of them, and each flanked a little below by two long straight stiff black hairs.

Three other species of Maro have previously been described, and are, as at present known, exclusively British. *Maro minutus* Camb.* and *M. falconerii* Jacks,† are usually a little smaller than *M. sublestus* and more unicolorous. The first examples of *M. minutus* Camb. (types, etc.), which has so far been confined to the Colne Valley, South-West Yorkshire, were obtained from amongst an old heap of sand-stones loosely embedded in the ground and covered with soil, and harmonised with them in colour, being of a uniform yellow-brown; later specimens found in other places, both in the open and in woods, have borne faint traces of darker markings or of more general suffusion. On comparing the epigynes of these two species with that of *M. sublestus*, the generic affinity of the three is at once evident, but in both the former, that organ is neither partly detached from the abdomen, nor projecting, nor so far as can be seen provided with any tubercles. The remaining species, *M. persimilis* Camb.‡ (1 ♀ Fenagh, Ireland), is doubtfully allocated to this genus. It is much the same size as *M. sublestus*, and has also certain darker markings, which are however, of a browner hue, and although its epigyne, which is of a different type from the others, is both partly detached and projecting, the backward process is of a totally different character and structure.

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The Museums Journal for June contains a paper on 'Regional Study in Museums,' by Professor H. J. Fleure.

The May list of additions to the Warrington Museum includes an item of '66 stone implements from French Cave deposits.'

We notice *The Library Assistant* contains an advertisement, 'Wanted, an Assistant Librarian and Caretaker for the Museum' of a Yorkshire Society.

We hear that the most important article in the last volume of *The Museums Journal* had reference to 'The preservation of Antiquities,' and was written by a German.

Manchester Museum Handbook (Publication 75) deals with the Stela of Sebek-khu, the earliest record of an Egyptian Campaign in Asia, and is by T. Eric Peet, B.A. It is sold at 2s.

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* 'Proceedings Dorset N. H. and A. F. Club,' vol. xxvii., 1906, figs. 12-18, and 'Trans. Nat. Hist. Soc. Northumberland, Durahm and Newcastle,' New Series, vol. iii., pl. iv., figs. 21-25.

† 'Trans. Nat. Hist. Soc. Northumberland, Durham and Newcastle,' New Series, vol. iii., pl. iv., figs. 16-20.

‡ 'Proc. Dorset N. H. and A. F. Club,' vol. xxxiii., 1912, figs. 20-22*a*.

NATURAL HISTORY OF SAWLEY AND EAVESTONE, NEAR RIPON.

(*Continued from page 208*).

Mollusca.—Mr. W. Denison Roebuck, F.L.S., writes that the conchologists explored Picking Gill and other parts of Sawley parish, the main part of the collections made being by Mr. Greevz Fysher that day and about Risplith the next. These notes include the mollusca which were collected by Mr. James Ingleby in the parish of Eavestone during the years 1882 to 1886 inclusive, and seen by Mr. J. W. Taylor and himself. As Mr. Ingleby pointed out, the district with its peaty soils on a millstone grit formation, is singularly unfavourable for mollusca.

Limax maximus and var. *cellaria*. Eavestone.
Agriolimax agrestis and var. *reticulata*. Abundant at Eavestone, Sawley, Picking Gill, Risplith, and Howhill Fountains.
A. lævis. Eavestone.
Arion ater. Eavestone, Sawley and Risplith; var. *luteopallescens* common at the two latter places.
A. subfuscus. Eavestone and Sawley; vars. *rufofusca* and *cinereofusca* at the latter place.
A. hortensis. Eavestone.
A. circumscriptus. Not uncommon, Eavestone, Sawley, Risplith. One at Howhill Fountains (Fysher).
A. intermedius and var. *grisea*. Sawley and Risplith.
Vitrina pellucida. Eavestone and Risplith.
Hyalinia cellaria. Common at Eavestone.
H. alliaria. A few at Eavestone and Sawley.
H. nitidula. Eavestone, a few.
H. crystallina. A small colony in a damp place among trees at Eavestone; a few at Sawley.
Pyramidula rotundata. Found in Fishpond Wood, Eavestone, not very common; common in Sawley parish.
Helix nemoralis. Eavestone, not very common.
H. hortensis var. *lutea* 12345. Eavestone, very rare.
Hygromia hispida. Picking Gill, one or two, fine.
Ena obscura. Stephenson Bank, Risplith, on a wall, very rare (Ingleby).
Clausilia bidentata and var. *albinos*. On old wall by roadside, Lodge Bank (another name for Stephenson Bank), Risplith (Ingleby).
Cochlicopa lubrica. On tiles at Eavestone, not very common; a few at Sawley.

The only water-shells are those noted by Mr. James Ingleby as follows:—

Pisidium fontinale. Common, taken from the side of a trout pond at Eavestone, a few days after the water had broken through the bank. The pond had been previously searched several times but nothing could be found there, but
Ancylus fluviatilis, and that rarely.
Pisidium pusillum and
Limnæa truncatula were numerous in a ditch fed by a spring at Eavestone, quite isolated from any other water. In summer the water of this ditch is often dried up, and the ditch was often scoured, and how the mollusca lived and multiplied was a mystery to Mr. Ingleby.

Anodonta cygnea. In the lake at Eavestone, very common.
Physa fontinalis. At Eavestone in 1882 was quite local and not numerous anywhere about. Behind Mr. Ingleby's former residence, Brim House, there was a small colony where it occurred under stones and on the grass; a curious habitat which should be investigated.

A further set of captures made by Mr. Fysher included the following:—

Planorbis albus. Not uncommon in Bryn Brae Lake or Pond.
Pisidium cinereum. One from same pond.
Hyalinia fulva. One.
H. pura var. *nitidosa.* One.
Acanthinula lamellata. One.

All these in company with *Clausilia bidentata* (of which the elongated var. *gracilior* also occurred), *Ena obscura, Hyalinia alliaria,* etc., on Stephenson Bank, Risplith.

These occurrences are most interesting, especially the *Planorbis* and *Pisidium cinereum,* while that of *Acanthinula lamellata* is a most important discovery of a new locality for a rare species of limited range.

COLEOPTERA.—Mr. Margerison states that he has taken *Halyzia* 18-*guttata* on Sawley Moor, identified by Mr. J. W. Carter, the fourth record for Yorkshire. *Nebria brevicollis, Sericosomus brunneus* and, *Otiorhynchus picipes,* which were submitted to Dr. W. J. Fordham for identification, were taken in Picking Gill on the day of the excursion.

ARACHNIDA.—Mr. W. P. Winter, B.Sc., writes:—The following lists are based on collections made by Mr. S. Margerison, and will perhaps furnish a foundation for future work. In many instances the species were identified by Mr. Falconer. The most interesting examples are *Hahnia pusilla* C.L.K., *Centromerus arcanus* Camb., *Lophocarenum mengii* Sim. and *Meta menardi* Latr., which are either rare or local. *Hahnia pusilla* C.L.K. (both sexes), has been recorded previously from Delamere Forest, Cheshire, and from Hebden Bridge, West Yorks., one ♀ from roots of heather. *Meta menardi* Latr. frequents caves, cellars and old ruins in the north of England, and has been found also in North Wales, Isle of Man, and widely in Ireland. As a Yorkshire species it is reported from caves and an old lead mine in the West Riding, and from Lonsdale in the North Riding.

LOCALITIES:—(*a*) Sawley, 1914.
(*b*) Risplith, January, 1915.
(*c*) Sawley, January, 1915; March, 1915.
(*d*) Sawley High Moor, March, 1915.
(*e*) Sawley, Spa Gill, April, 1915.

Segestria senoculata Linn., ♀, *c.*
Drassus lapidosus Walck., ♀, *d.*
Clubiona trivialis L. Koch, ♀, *d.*
C. comta C.L.K., Imm. ♀, *a.*
Dictyna arundinacea Linn., Imm. ♀, *c.*
Amaurobius similis Bl., ♀, *c, e* (and ♂), *b.*

Amaurobius fenestralis Stroem. Several ♀♀, *a*, *e* (and ♂), *c*.
Cryphoeca silvicola C.L.K., *c* (♂), *e* (♀).
Coelotes atropos, ♀, Walck., *a*.
Tegenaria derhamii Scop., ♀, *a*, *b*.
Hahnia pusilla C.L.K.), ♀, *d*.
Theridion pallens Bl., ♂, *d*.
Phyllonethis lineata Clerck., ♀, *a*.
Linyphia insignis Bl., Imm. ♀ and ♂, *a*.
L. montana Clerck., ♀, ♂, *a*, *c*.
L. triangularis Clerck., ♀, ♂, *a*.
L. peltata Wid., ♀, ♂, *a*, *c*.
Labulla thoracica Wid., ♀, ♂, *a*, *e*.
Leptyphantes minutus Bl., Imm. ♀, *a*.
L. leprosus Ohl., ♀, *c*, *e*.
L. terricola C.L.K., ♀, *e*.
L. blackwallii Kulcz., ♀, *a*, *d*.
L. obscurus Bl., ♀, *a*.
L. pallidus Camb., ♀, *a*.
L. tenuis Bl., ♂, *a*.
L. ericaeus Bl., ♂, *a*.
Poeciloneta globosa Bl., Imm. ♀, ♂, *a*
**Bathyphantes concolor* Wid., ♀, ♂, *a*
Maso sundevallii Westr., ♀, *a*, *d*.
Macrargus rufus Wid., ♂, *c*.
Centromerus arcanus Cb., ♀, ♂, *d*.
Oedothorax retusus Westr., ♂, *a*.
Lophomma herbigradum Bl., ♀, *d*.
Neriene rubens Bl., ♀, *d*.
Diplocephalus cristatus Bl., ♀, *a*.
D. picinus Bl., several ♀♀, *a*.
D. fuscipes Bl., ♂, *a*.
Lophocarenum mengii Linn., ♀, *d*.
Minyriolus pusillus Wid., ♀, *d*.
Tapinocyba pallens Cambr., ♂, *d*.
**Walckenaera acuminata* Bl., ♀,
Ceratinella brevipes Westr., ♀, *d*.
Nesticus cellulanus Clk., ♀, *c*.
Meta segmentata Clerck., ♀, *a*, *d*.
M. merianae Scop., ♀, *a*, *c* (and ♂).
M. menardi Latr.., ad ♂ from Ned Hole, Eavestone Lake, Sawley, April, 1915. Also a cocoon from a cleft in the same district.

PSEUDOSCORPION.

Obisium muscorum Leach, *a*, *d*, *e*.

HARVESTMEN.

Nemastoma lugubre O.F.M., *a*, *d*.
Oligolophus morio Fabr., *a*.
O. agrestis Meade, Imm., *a*.

FLOWERING PLANTS.—Mr. W. E. L. Wattam writes :—The tardiness of springtime was everywhere apparent except where shade from the prevalent easterly winds was best afforded to plant life. From the varied nature of the ground traversed, no doubt it would prove most interesting say from June to August. The coniferous belts of woodland, especially throughout the whole extent of Picking Gill, was one of the pleasing features of the walk. Their composition is luxuriant examples of Spruce Fir, Larch, and Scot's Pine. At the extreme end of Hebden Woods are several fine specimens of Wellingtonia, and close by thriving Corscian Pine and Douglas Fir. Midway down the Gill is a dense growth of Rhododendron, and imagination alone can picture the beauty of that particular area when in full blossom, of which there was great promise. In the open parts of the Gill, Bracken grows to perfection, while Bilberry and Ling are also not uncommon plants among the grit strewn oak portions of the wooded areas. In the shade, Dog's Mercury, with Lesser Celandine, and patches of Wood Anemone, are the striking features of the ground vegetation, while *Luzula pilosa* and *L. maxima* favour the moister parts. In the lake is an abundance of Canadian Weed and oblong-leaved Pondweed. The swamps in Wet Car and Mill Gill Woods were glorified with the blossoms of the Marsh Marigold, and here

* Collected by Mr. Wattam on the Excursion, 1915.

also were a fair amount of the prominent flowers of the alternate-leaved Golden Saxifrage. Other plants noted were Hairy Bitter Cress, Hemlock Water Dropwort, Water Crowfoot, Water Capitate Mint, Yellow Flag, Marsh Thistle, Valerian, and Tufted Hair Grass. The slopes of Wet Carr Wood, wherein the chief tree is Oak, had a dominant ground vegetation of Holcus-Bracken-Bluebell, with sundry patches of Wood Anenome, Red Campion, Wood Sanicle, and Broad-leaved Garlic. Near Sawley Hall was Sweet Violet, Dog Violet, Ivy-leaved Toadflax, Tuberous Moschatel, Cuckoo Pint and Toothwort. Along the road to Sawley were Purple Dead Nettle, Jack-by-the-Hedge, Primrose, Foxglove, and Ground Ivy. The Cowslip is abundant in the pastures. Honeysuckle, Blackthorn, and Gooseberry are conspicuous in the hedgerows. The Common Polypody and Wall Rue are not uncommon ferns.

Mr. Margerison adds that he has noted over 200 species of flowering plants and ferns in the Sawley district. Herb Paris occurs below Eavestone Lake; Monkshood and Snowdrop, both species probably only naturalised, occur on the Sawley side of Spa Gill. The Lily of the Valley grows in Calf Haugh Wood, where the Oak and Beech Ferns have also been noted. The autumn Crocus is abundant in a field outside the Sawley Township towards Ripon, and the Daffodil occurs sparingly in a few fields. The Bird Cherry known locally as 'Heg-Berry,' is not uncommon.

Bryology.—Mr. C. A. Cheetham writes:—The selected route through Picking Gill promised well but the results were disappointing, the gritstone woodland seemed comparable with the woods by the Strid at Bolton and mosses known there were to be expected. There is no lack of either mosses or hepatics, but greatly restricted in variety of species. Commencing at the head of the Gill, the ponds gave a few common types, *Hypnum cuspidatum, Bryum pallens, B. pseudo-triquetrum,* etc. The rocks here were dry. *Dicranum fuscescens, D. scoparium, Campylopus flexuosus* and *Dicranoweisia cirrhata* were found, these being general on the drier rocks throughout. Further down on the Black Dyke, a subsidiary streamlet, the moister rocks were better, *Tetraphis pellucida, T. Browniana, Plagiothecium undulatum. P. denticulatum, Leucobryum glaucum, Dicranum majus,* etc., being added. The streamlet bed is dominated by hepatics and one moss, *Hyocomium flagellare* this in a varied series of forms from the finely pinnate to the almost simple and extremely robust, and in shade to the very complanate forms, for one unused to this moss it is an excellent place to study it. *Mnium hornum,* which is perhaps the best distributed moss in the area, was found on rocks in the stream occasionally. Time interfered with us here, and the next streamlet, even more promising, had to be left unworked, a

move being made to the high rhododendron clad slopes overlooking the first of the Wellingtonias. There again came hope without realization, for on the rotting tree trunks and old fern roots plants like *P. latebricola* and *Dic. strictum* were expected but the only *Plagiothecium* beyond those previously mentioned was *elegans* and its var. *collinum*.

To look at the valley as a whole, the principal mosses are : *Mnium hornum, Dicranium majus, D. scoparium, D. fuscescens, Campylopus flexuosus, C. pyriformis, Dicranoweisia cirrhata, Tetraphis pellucida, Dicranella heteromalla* and *Leucobryum glaucum*. Were these to be removed it would leave a wilderness as far as mosses are concerned.

Below the Gill on gritstone walls in the open, *Grimmia trichophylla* was seen fruiting with one or two *Othotricha* and *Ptychomitrium polyphyllum*, etc. Mill Gill had to be passed through unsearched.

The whole district of Sawley is not included in this walk nor are its resources exhausted ; the Skell valley has many good things, *Fontinalis squamosa, Catharinea crispa, Weisia tenuis, Seligeria recurvata, Leptodontium flexifolium*, etc. Then at Eavestone Lakes, *Orthodontium gracile* occurs and in the High Moor plantations, *Dicranum strictum* and *Ditrichum homomallum*.

A definite gritstone area such as this will repay more detailed work, and we propose to give it careful study. The following seem to be new drainage records for the West Riding Flora :—

Catharinea crispa (*Atrichum*).
Polytrichum urnigerum (*P. subrotundum*) (*Pogonatum*).
Ditrichum homomallum.
Dicranella rufescens (*Anisothecium*).
Campylopus flexuosus.
C. fragilis.
Leucobryum glaucum.
Grimmia trichophylla.
Rhacomitrium fasciculare (*Grimmia*)
R. heterostichum (*Grimmia*).
R. canescens (*Grimmia*).
Pottia truncatula.
Zygodon viridissimus.
Orthotrichum cupulatum.
O. affine.
O. diaphanum.
Physcomitrium pyriforme.
Orthodontium gracile (*Stableria*).
Webera annotina (*Pohlia*).
W. proligera (*Pohlia*).
W. carnea (*Pohlia*).
Mnium stellare.
Fontinalis squamosa.
Heterocladium heteropterum.
Brachythecium albicans (*Hypnum*).
B. plumosum (*Hypnum*) (*H. pseudoplumosum*).
Eurhynchium piliferum (*Hypnum*).
E. crassinervium (*Hypnum*).
E. Swartzii (*Hypnum*).
Plagiothecium silvaticum (*Hypnum*)
Hypnum uncinatum (*Amblystegium aduncum*).
H. stramineum (*Amblystegium*).

FUNGI.—Mr. A. E. Peck writes:—Mr. M. Malone and I represented the Mycological Committee. Species peculiar to springtime were not met with, the chief finds being parasitic fungi of last year's growth, these occurring on their usual hosts. The woodlands of the district are very attractive and no doubt an autumnal visit would produce much of interest to the Mycologist. The following are the species noted :—

Tubaria furfuracea.
Hypholoma fasciculare.
Coprinus micaceus.
Polyporus squamosus.
P. betulinus. On birch.
P. brumalis.
P. cuticularis. On alder.
Fomes fomentarius. On plum.
F. annosus. On Conifer stumps.
Daedalea quercina. On oak stumps
Polystictus versicolor. On stumps.
Poria vaporaria.
Hymenochaete rubiginosa.
Stereum hirsutum.
Corticium Sambuci.
Bovista nigrescens.
Scleroderma vulgare.
Dasyscypha calycina.
D. virgineus.
Helotium cyathoideum.
Mollisia cinerea.
Chlorosplenium aeruginosa.
Exoascus turgidus. (Witches broom).
Rhytisma acerinum. (On Sycamore leaves).
Phyllachora pteridis. (On bracken stems).
Xylaria hypoxylon.
Lephodermium Rhododendri.
Heptameria acuta. (On dead nettle stems).
Nectria cinnabarina.
Frankinella alni. (On roots of alder).

The following Mycetozoa have been met with in the Sawley district by Mr. A. R. Sanderson, of Bradford, since January last :—

Badhamia utricularis Berk. (plasmodium feeding on Grandinia granulosa).
Physarum nutans Pers. (stalked and sessile forms, including plasmodiocarps).
Craterium minutum Fr. On holly leaves.
Didymium squamulosum Fr. Common on leaves of various kinds.
Stemonitis fusca Roth. On dead sycamore.
Comatricha obtusata Preuss. On dead elm.
Cribraria argillacea Pers. On dead pine.
Trichia affinis De Bary. Fruiting on moss.
T. persimilis Karst. On willow.
T. scabra Rost. On willow.
T. varia Pers. On various dead wood.
T. Botrytis Pers. On rotten wood.
Arcyria ferruginea Sant. On pine.
A. punicea Pers. On dead ash.
A. cinerea Pers. On dead ash.
Perichaena corticalis Rost. On alder and elm.
Tubifera ferruginosa Gmel. Among pine needles.

Lichens.—Mr. Wattam writes :—The list of species enumerated below has been compiled in chief from materials collected during the past winter, and sent to me by Mr. Samuel Margerison. It would have been impossible on the day of the excursion to have covered the great extent of ground from which the lichens have been collected by him. To Mr. Margerison must be given due appreciation for his energy in enabling me to present so large a list of species from within the area. It is not claimed that its lichen flora is by any means exhausted, and doubtless many additions will still be made.

I devoted my attention to Picking Gill, and the lower part of Hebden Woods, Wet Car and Mill Gill Woods. The slight rainfall was naturally beneficial to this class of plants, and they showed their beauty to perfection, especially in Picking Gill. The outstanding feature was the great abundance of *Parmelia saxatilis* L., which covered the huge grit boulders and the boles of trees with immense silvery bosses, even to the highest

elevation (Lord's Nab). A great competitor, especially on tree boles and outcropping roots thereof, and also upon dead branches of Sprucé Fir, was the crimped *Parmelia physodes* Ach, while the darker sheen of *Parmelia tiliacea* Ach. was likewise common. The frondose *Evernia furfuracea* Mann. thrived best on the tops of the gritstone walls, but tree boles were also another of its habitats. In the open spaces in the woodlands, and on soil covered boulders, species of *Cladonia*, especially *C. gracilis, macilenta, pyxidata,* and *squamosa,* were very beautiful and conspicuous, occurring in large sheets. The Eavestone and Sawley records have been kept separate; the species occurring in the Eavestone area only are signified by a dagger; those from Sawley only by an asterisk; unmarked species denote that they occur in both areas.

Collema furvum Ach.
†*C. pulposum* Ach.
† var. *tenax* Ach.
**Trachylia tympanella* Fr.
Sphaerophorus coralloides Pers.
S. fragilis Ach.
**Baeomyces rufus* DC.
†*Cladonia cervicornis* Schaer.
C. cornucopioides Fr.
C. digitata Hoffm.
f. *polydactyla* Flk.
C. fimbriata Fr.
C. furcata Hoffm.
var. *spinosa* Hook.
C. gracilis Hoffm.
var. *chordalis* Ach.
C. macilenta Hoffm.
var. *scabrosa* Nyl.
† f. *carcata* Nyl.
**C. pityrea* Floerke.
C. pyxidata Fr.
†*C. sobolifera* Del.
C. squamosa Hoffm.
Cladina sylvatica Nyl.
C. uncialis Nyl.
†*Usnea barbata* f. *plicata* Fr.
†*U. hirta* Hoffm.
Evernia furfuracea Mann.
**Ramalina farinacea* Ach.
**R. fraxinea* Ach.
**Peltigera canina* Hoffm.
**Parmelia caperata* Ach.
**P. conspersa* Ach.
P. fuliginosa Fr.
P. laevigata Ach.
**P. perlata* Ach.
* var. *ciliata* Nyl.
P. physodes Ach.
var. *labrosa* Ach.
P. scortea Ach.
P. tiliacea Ach.
P. saxatilis L.
f. *furfuracea* Schaer.
**Physcia lychnea* Nyl.
P. parietina De Not.
**P. pulverulenta* (Schreb).
**P. stellaris*, subsp. *tenella* Nyl.
**Pannaria rubiginosa* Del.
**P. pezizoides* (Web.)
**Lecanora atra* Ach.
**L. badia* Ach.
**L. ferruginea* Huds.
**L. gibbosa* Ach.
**L. sophodes* Ach.
**L. subfusca* L.
**L. sulphurea* Ach.
**L. symmicta* Ach.
**L. varia* Ach.
†*L. ventosa* L.
L. vitellina Ach.
* var. *aurella* Ach.
**Urceolaria scruposa* Ach.
Pertusaria amara Nyl.
P. communis D.C.
* f. *rupestris* DC.
**P. globulifera* Nyl.
**Lecidia coarctata* Nyl.
†*L. confluens* Ach.
L. contigua Fr.
* var. *flavicunda* Nyl.
* var. *platycarpa* Fr.
†*L. endoluca* Nyl.
L. lucida Ach.
**L. sanguinaria* L.
**L. quernea* Dicks.
†*L. uliginosa* Tayl.
**Bilimbia aromatica* Jatta.
**Buellia parmeliarum* Oliv.
**Rhizocarpon geographicum* DC.
**Opegrapha atra* Pers.
†*O. vulgata* Ach.
†*Graphis scripta* Ach.
**Arthonia pruninosa* Ach. Sydow.
**A. radiata* Ach. var. *Swartziana.*
† *Verrucaria margacea* Wahl.
† *V. rupestris* Schrad.

1915 July 2.

A CUMBERLAND NATURE RESERVE.

(*Continued from page 191*).

Most attention was given to the Coleoptera, of which there are practically no records from Kingmoor. I was both surprised and pleased to meet with considerable success.

During the year I took 258 species of beetles made up as follows :—18 Ground Beetles, 31 Water Beetles and their allies, 63 Cocktails (Brachelytra), 33 Clavicorns, 3 Chafers, 7 Skipjacks, 16 Soldier Beetles and their allies, 4 Teredilia, 1 Longhorn, 30 Phytophaga and 52 Weevils. Many of these of course, are generally common insects, but a good proportion are local and scarce in Cumberland.

Coleoptera.

Notiophilus biguttatus F.
N. palustris Duft.
Nebria gyllenhali Sch.
Clivina fossor L.
Bradycellus similis Dj.
Harpalus latus L.
H. ruficornis F.
Pterostichus versicolor Stm.
P. madidus F.
P. diligens Stm.
Amara communis Pz.
Calathus melanocephalus L.
Anchomenus dorsalis Müll.
Bembidium guttula F.
B. lampros Hbst.
B. littorale Ol.
Trechus minutus F.
Dromius 4-maculatus L.
Haliplus ruficollis De G.
H. lineatocollis Marsh.
Hydroporus lepidus Ol.
H. gyllenhali Schiöd.
H. palustris L.
H. memnonius Nic.
H. nigrita F.
H. pubescens Gyll.
H. planus F.
Agabus sturmi Gyll.
A. chalconotus Pz.
A. bipustulatus L.
Ilybius fuliginosus F.
Colymbetes fuscus L.
Dytiscus punctulatus F.
Gyrinus natator Scop.
Hydrobius fuscipes L.
Anacœna globulus Pk.
A. limbata F.
Limnebius truncatellus Thunb.
Helophorus aquaticus L.
H. æqualis Th.
H. quadrisignatus Bach.
Helophorus æneipennis Th.
H. brevipalpis Bed.
Ochthebius pygmæus F.
Hydrœna riparia Kug.
Cercyon melanocephalus L.
C. flavipes F.
C. lateralis Marsh.
C. hœmorrhoidalis F.
Aleochara lanuginosa Gr.
A. succicola Th.
Oxypoda opaca Gr.
Drusilla canaliculata F.
Homalota gregaria Er.
H. elongatula Gr.
H. malleus Joy.
H. circellaris Gr.
H. eremita Rye.
H. analis Gr.
H. nigra Kr.
H. atricolor Shp.
H. atramentaria Gyll.
H. longicornis Gr.
H. muscorum Bris.
H. laticollis Steph.
H. fungi Gr.
Tachyusa atra Gr.
Leptusa fumida Er.
Conosoma lividum Er.
Tachyporus obtusus L.
T. chrysomelinus L.
T. hypnorum F.
T. pusillus Gr.
Tachinus rufipes De G.
T. marginellus F.
Bolitobius trinotatus Er.
B. pygmæus F.
Quedius mesomelinus Marsh.
Q. tristis Gr.
Q. boops Gr.
Philonthus politus F.
P. varius Gyll.

Philonthus sordidus Gr.
P. concinnus Gr.
P. varians Pk.
Xantholinus punctulatus Pk.
X. linearis Ol.
Baptolinus alternans Gr.
Othius fulvipennis F.
Lathrobium fulvipennis Gr.
Lathrobium brunnipes F.
Stenus bimaculatus Gyll.
S. speculator Lac.
S. providus var. *rogeri* Kr.
S. declaratus Er.
S. brunnipes Steph.
S. ossium Steph.
S. impressus Germ.
S. nitidiusculus Steph.
S. picipes Steph.
S. similis Hbst.
S. flavipes Steph.
Platystethus arenarius Fourc.
Oxytelus rugosus F.
O. laqueatus Marsh.
O. tetracarinatus Block.
Homalium rivulare Pk.
H. rufipes Fourc.
H. concinnum Marsh.
Anthobium sorbi Gyll.
A. torquatum Marsh.
A. minutum F.
Silpha atrata L.
Choleva velox Spence.
C. tristis Pz.
C. kirbyi Spence.
Adalia bipunctata L.
Coccinella 10-*punctata* L.
C. hieroglyphica L.
Halyzia 14-*guttata* L.
Scymnus suturalis Thunb.
Rhizobius litura F.
Coccidula rufa Hbst.
Onthophilus striatus F.
Epuræa æstiva L.
E. obsoleta F.
Meligethes æneus F.
M. lumbaris Stm.
M. viridescens F.
M. picipes Stm.
Rhizophagus bipustulatus F.
Lathridius lardarius De G.
Coninomus nodifer West.
Enicmus transversus Ol.
Melanophthalma gibbosa Hbst.
M. fuscula Hum.
Byturus tomentosus F.
Antherophagus nigricornis F.
Cryptophagus affinis Stm.
Micrambe vini Pz.
Atomaria fuscata Sch.
A. analis Er.
Typhæa fumata L.
Byrrhus pilula L.
Cytilus varius L.
Aphodius fimetarius L.
A. merdarius F.
A. punctato-sulcatus Stm.
Cryptohypnus riparius F.
Athous hæmorrhoidalis F.
Sericosomus brunneus L.
Agriotes obscurus L.
A. pallidulus Ill.
Dolopius marginatus L.
Corymbites quercus Gyll.
Microcara livida F.
Cyphon pallidulus Boh.
Telephorus rusticus Fall.
T. lividus L.
T. pellucidus F.
T. nigricans v. *discoideus* Steph.
T. figuratus Man.
T. bicolor F.
T. flavilabris Fall.
Rhagonycha fulva Scop.
R. limbata Th.
R. pallida F.
Malthodes marginatus Lat.
M. pellucidus Kies.
M. minimus L.
M. atomus Th.
Priobium castaneum F.
Cis boleti Scop.
C. festivus Pz.
Octotemnus glabriculus Gyll.
Rhagium bifasciatum F.
Lema lichenis Vœt.
Chrysomela staphylea F.
C. polita L.
Phædon tumidulus Germ.
Phyllodecta vitellinæ L.
Hydrothassa marginella L.
H. aucta F.
Luperus rufipes Scop.
Lochmœa suturalis Th.
Galerucella tenella L.
Longitarsus holsaticus L.
L. luridus Scop.
L. suturellus Duft.
L. melanocephalus De G.
L. pusillus Gyll.
Phyllotreta undulata Kutz.
P. flexuosa Ill.
P. exclamationis Thunb.
Mantura rustica L.
Crepidodera ferruginea Scop.
C. smaragdina Foud.
Plectroscelis concinna Marsh.
Psylliodes affinis Pk.
Cassida viridis L.
C. flaveola Thunb.
Rhinosimus planirostris F.

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Anaspis frontalis L.
A. rufilabris Gyll.
A. maculata Fourc.
A. ruficollis F.
Deporaus betulæ L.
Apion ulicis Först.
A. genistæ Kirb.
A. apricans Hbst.
A. assimile Kirb.
A. dichroum Bed.
A. carduorum Kirb.
A. virens Hbst.
A. pisi F.
A. ervi Kirb.
A. scutellare Kirb.
A. loti Kirb.
A. affine Kirb.
A. violaceum Kirb.
A. humile Germ.
Otiorhynchus picipes F.
Strophosomus coryli F.
S. lateralis Pk.
Sciaphilus muricatus F.
Polydrusus cervinus L.
Phyllobius pyri L.
P. argentatus L.
P. uniformis Marsh.
Sitones cambricus Steph.
Sitones regensteinensis Hbst.
S. tibialis Hbst.
S. hispidulus F.
S. suturalis Steph.
S. sulcifrons Thunb.
Hypera punctata F.
H. polygoni L.
H. nigrirostris F.
Orchestes quercus L.
O. fagi L.
O. rusci Hbst.
O. stigma Germ.
Rhamphus flavicornis Clair.
Erirhinus acridulus L.
Dorytomus maculatus Marsh.
Anoplus plantaris Næz.
Gymnetron beccabungæ L.
Anthonomus comari Crotch.
Cœliodes rubicundus Hbst.
C. quercus F.
C. quadrimaculatus L.
Ceuthorrhynchus assimilis Pk.
C. contractus Marsh.
C. quadridens Pz.
Ceuthorrhynchidius floralis Pk.
C. troglodytes F.
Balaninus salicivorus Pk.
B. pyrrhoceras Marsh.

Particular interest attaches to three species, viz. :—

Helophorus quadrisignatus, of which I took two specimens in a small pond, in May.

Psylliodes affinis, a numerous colony found on the Woody Nightshade in August.

Apion genistæ, abundant on the Petty Whin in May and again in August, so that it is evidently double-brooded.

These three species are now recorded for the first time as natives of Cumberland. It is apparent, therefore, that Kingmoor must be reckoned as a good locality for beetles.

I also collected a number of Hemiptera and Hymenoptera, but have not yet worked out the nomenclature.

One dragon-fly (*Agrion puella*) was abundant, and possibly other species occur.

Flora of Kingmoor, 1914.

Flowering Plants, etc.—Mr. T. Scott Johnstone writes :—Between the beginning of April and the end of October a number of visits have been paid to the Moor. The fact that it has been let for grazing purposes for a number of years, beyond interfering with its natural wild features, has perhaps not had such an adverse effect on the flora as might have been anticipated, and in the course of another year or two the Moor will, it is to be hoped, present a very different and improved appearance.

Until the past year, no very thorough attempt has apparently been made to compile a complete record of the flora of Kingmoor. Some records of the rarer or less common species we have, by various observers, the earliest being that by T. C. Heysham, a former Mayor of Carlisle, who was the first to record, in 1837, the appearance of the Whorl-leaved Meadow Parsnip (*Carum verticillatum*) on Kingmoor, no other station in Cumberland, save one—in the Keswick district—being known for it.

It is satisfactory to note that it still flourishes on the Moor and of late years appears to have considerably increased.

The subjoined list is a record, as full as it has been possible to make it, of all plants hitherto found. All except those indicated by a dagger have been noted during the past season, and where a plant found during the present year has been the subject of a previous record it is distinguished by an asterisk.

The plants indicated by a dagger (†) are, for the most part, of somewhat local or rare occurrence. There are only eleven of these, and we hope to re-establish the old records as well as add new ones as time goes on. One, *Habenaria bifolia*, the Butterfly orchis, was, some years ago, very plentiful on the Moor, and it has therefore been somewhat disappointing that not a single specimen has been noticed during the past year.

I.—Ranunculaceæ.

Anemone nemorosa L.
**Ranunculus Flammula* L.
R. acris L.
R. repens L.
Caltha palustris L.

VI.—Cruciferæ.

Barbarea vulgaris Ait.
Cardamine pratensis L.
Brassica arvensis O. Kuntze.

IX.—Violaceæ.

Viola Riviniana Reichb.

X.—Polygalaceæ.

**Polygala vulgaris* L.
**P. serpyllacea* Weihe.

XII.—Caryophyllaceæ.

Lychnis Flos-cuculi L.
Stellaria media Vill.

XVI.—Hypericaceæ.

Hypericum quadrangulum L.

XXV.—Leguminosæ.

**Genista anglica* L.
* *Ulex europæus* L.
* *U. Galii* Planch.
Cytisus scoparius Link.
Trifolium pratense L.
T. repens L.
T. dubium Libth.
Lotus corniculatus L.
Vicia tetrasperma Moench.
V. sepium L.
V. sativa L.
Lathyrus pratensis L.

XXVI.—Rosaceæ.

Rubus fruticosus L.
Potentilla erecta Hampe.
Poterium officinale A. Gray.
†*Rosa eglanteria* Huds.
R. canina L.
Pyrus Malus L.

XXVII.—Saxifragaceæ.

Chrysosplenium oppositifolium L.

XXIX.—Droseraceæ.

†*Drosera rotundifolia* L.

XXXI.—Lythraceæ.

Lythrum Salicaria L.

XXXIV.—Umbelliferæ.

**Carum verticillatum* Koch.
Anthriscus sylvestris Hoffm.
**Angelica sylvestris* L.
Heracleum Sphondylium L.
Daucus Carota L.
Caucalis Anthriscus Huds.

XXXV.—Araliaceæ.

Hedera Helix L.

XXXVII.—Caprifoliaceæ.

Lonicera Periclymenum L.

XXXVIII.—Rubiaceæ.

**Galium saxatile* L.
G. palustre L.

XXXIX.—Valerianaceæ.

* *Valeriana officinalis* L.

XL.—Dipsaceæ.

**Scabiosa Succisa* L.

XLI.—Compositæ.

Bellis perennis L.
Gnaphalium uliginosum L.
**Achillea Ptarmica* L.
Chrysanthemum Leucanthemum L.
Tussilago Farfara L.
**Senecio aquaticus* Hill.
Carduus crispus L.
Cnicus lanceolatus Willd.
C. palustris Willd.
C. arvensis Hoffm.
†*Serratula tinctoria* L.
Centaurea nigra L.
† *C. Cyanus* L.
Hieracium boreale Fr.
Hypochæris radicata L.
Leontodon autumnale L.
Taraxacum officinale Weber.

XLII.—Campanulaceæ.

†*Jasione montana* L.
Campanula rotundifolia.

XLIV.—Ericaceæ.

Calluna vulgaris Hull.
**Erica Tetralix* L.
†*Pyrola minor* Sw.

XLVII.—Primulaceæ.

† *Centunculus minimus* L.

LII.—Borragineæ.

Myosotis cæspitosa Schultz.

LIV.—Solanaceæ.

**Solanum Dulcamara* L.

LV.—Scrophulariaceæ.

† *Veronica Anagallis* L.
V. Beccabunga L.
Bartsia Odontites Huds.
Pedicularis sylvatica L.

LIX.—Labiatæ.

Prunella vulgaris L.
Ajuga reptans L.

LX.—Plantaginaceæ.

Plantago major L.
P. lanceolatus L.

LXIV.—Polygonaceæ.

Polygonum aviculare L.
P. Persicaria L.
Rumex conglomeratus Murr.
Rumex sanguineus L.
R. crispus L.
R. Acetosa L.

LXXI.—Urticaceæ.

Urtica dioica L.

LXXIII.—Cupuliferæ.

Betula alba L.
Quercus Robur L.
Fagus sylvatica L.

LXXIV.—Salicaceæ.

Salix alba L.
S. aurita ♀ L.
S. aurita ♂ L.
S. cinerea ♀ L.
S. cinerea ♂ L.
S. repens L.

LXXVII.—Coniferæ.

Pinus sylvestris L.

LXXIX.—Orchidaceæ.

Orchis latifolia L.
O. maculata L.
† *Habenaria bifolia* Br.

LXXXIII.—Liliaceæ.

†*Allium vineale* L.

LXXXIV.—Juncaceæ.

Juncus conglomeratus L.
J. acutiflorus Ehrh.
Luzula campestris D.C.

LXXXVIII.—Alismaceæ.

†*Alisma Plantago* L.

XCI.—Cyperaceæ.

Eriophorum angustifolium Roth.
Carex vulgaris Fries.
C. panicea L.
C. distans L.
C. flava L.

XCII.—Gramineæ.

Anthoxanthum odoratum L.
Agrostis canina L.
Deschampsia cæspitosa L.
Holcus lanatus L.
Cynosurus cristatus L.
Molinia cærulea Mænch.
Dactylis glomerata L.
Briza media L.
Poa annua L.
Festuca ovina var. *B. capillata* Hackel.
Nardus stricta L.

XCIII.—Filices.

Athyrium Filix-fœmina Roth.
Lastrea Filix-mas Presl.
Polypodium vulgare L.

It is not claimed that the list given is an exhaustive Flora of the moor. Probably many common things have been overlooked. But it is given as a basis to which additions may be made from year to year, and it may in the meantime be noted that of the 98 British orders of Flowering Plants, 89 are represented in Cumberland, and 38 of these on Kingmoor, the actual number of species as so far recorded being 122 as against some 1,200 for the whole of Cumberland and 2,075 for the whole of Great Britain and Ireland.

Mosses and Liverworts.—Mr. J. Murray writes:—The following plants were found during a visit on April 11th, 1914:—*Sphagnum squarrosum* Pers., was the only species of bog moss found, all the specimens being very stunted. A plant superficially very like a Sphagnum, but very different under the microscope, was *Leucobryum glaucum* Schp., several large tufts of which were noticed. On several places where fires had been, the large round tufts of *Funaria hygrometrica* Sibth., had sprung up. On the dry banks the reddish purple tufts of *Ceratodon purpureus* Brid. were just maturing their fruit, and added colour to the black earth. A moss which I found on the moor some years ago, but which I could not find again this year, was *Ephemerum serratum* Hpe. This is one of the smallest of mosses, resembling a green film on the ground, so is not easy to detect. On these same dry banks *Mnium hornum* Linn. was fairly abundant, but had not come into fruit, nor were the male catkins found. At the northern end of the moor, and in the wettest parts were several characteristic mosses, *Hylocomium triquetrum* B. and S., with its recurved leaves was conspicuous. Two others growing in fair quantity were *Hypnum Schreberi* Willd. and *Hypnum palustre* Huds. *Hypnum cupressiforme* Linn. with its strongly falcate leaves, was common both in separate tufts, and mixed with the above named mosses. Some of the plants came very near the var. *ericetorum* B. and S. Barren tufts of *Dicranum scoparium* Hedw. were not rare.

Only three common species of liverworts were found:—*Calypogeia trichomanis* Linn. growing over mosses; *Lophocolea bidentata* Linn. on dead wood, and *Diplophyllum albicans* Linn. on the edge of a ditch.

This list is somewhat meagre, but the locality is not a good one for either mosses or liverworts. Others will yet be found, but probably 50 or 60 species will be all that will be discovered.

———: o :———

We have received an interesting volume entitled '**The Break-up of Europe**,' a prophetic translation of Claudian's Masterpiece against Rufinus in two books (translated from the Latin of Claudian), re-printed A.D. 1914 by **W. W. Strickland, B.A.**, Trinity College, Cambridge. It is printed and published by R. H. Smithson & Blanchard, Yorkersgate, Malton. The author, Sir Walter Strickland, is a member of a well-known Yorkshire family, and his present work is especially appropriate at the present time.

NORTHERN NEWS.

The Journal of the Board of Agriculture for June contains an article on 'The Prevention of Egg-Laying on Turnips by the Diamond-Back Moth,' by R. A. Harper Gray.

We see much made in the daily press of 'a scorpion with a sting notoriously venomous,' brought to Leeds in a crate of bananas. The 'reptile' was taken to a local naturalist, who appears to have supplied the news.

The Annual Report of the Board of Regents of the Smithsonian Institution for 1913, just received, includes a number of important papers, among them being 'Whale Fisheries of the World,' by Charles Rabot, and another 'The Most Ancient Skeletal Remains of Man,' by Dr. A. Hrdlicka; both are well illustrated.

The twenty-fourth annual report of *The Royal Society for the Protection of Birds* has been issued (84 pages, 1s.) and is an excellent record of this society's achievements. Perhaps Yorkshire does not take quite such a prominent part in the work of this society that it would do, were it not for the fact that this county already has its own Bird Protection Committee, which is doing such good work.

The Journal of the Quekett Microscopical Club for April contains the following notes: 'The Early History of the Quekett Microscopical Club,' by R. T. Lewis; 'A New Copepod found in Water from Hollows on Tree Trunks,' by D. J. Scourfield; 'Some Details in the Anatomy of the Rat Flea,' by A. E. Minchin; Presidential Address on the 'Biological Conception of Individuality,' by A. Dendy; 'British Hydracarina: the Genius *Lebertia*,' by W. Williamson and C. D. Soar.

Mr. C. S. Middlemiss, of the India Geological Survey, who was a native of Hull, and many years ago spent much time in investigating the geology of East Yorkshire, has made a valuable addition to the geological section of the Hull Museum. He has presented his entire collection, the specimens being all carefully labelled and catalogued, and most of them refer to East Yorkshire. Some years ago Mr. Middlemiss had an opportunity of examining the interesting sections in the Kellaways Rock at South Cave, which were made during the construction of the Hull and Barnsley Railway, and described in the *Geological Magazine* at the time. The South Cave specimens, together with many others from the red and white chalk, etc., are included, and in addition there is a valuable series of rocks, with a catalogue giving full localities, etc.

There are various methods of describing natural history records; but the following, which is only a part of the discourse, appears under the head of 'An interesting find at Robin Hood's Bay,' in a recent journal, and, presumably, has to do with a record of 'The Worm Pipe Fish':—

'In modern warfare there are two general methods of dealing death with rifles. In the first the soldiers drawn up in a certain stratagetic order fire in unison in the direction of the enemy without taking special aim at any individual. The effectuality of this method depends more or less on the laws of chance. Whilst the majority of the bullets whistle harmlessly past the heads of the enemy (not without their moral effect perhaps), a deadly few find human billets, achieving from the stratagists point of view economical success. The other method is that of the sharp-shooter who carefully picks out a commanding position. Here he methodically calculates the range of the distant enemy, the rise and fall of the intervening country, the direction and force of the wind. Slowly, but surely, he adjusts the sights and guages on his specially-chosen rifle, and gives it its deadly charge; carefully picks out the individual enemy whose soul and body he wishes to disconnect; steadily aims, fires—and gives vent to a feeling of surprise and deprecating annoyance if the chosen one does not re-act in the generally-accepted manner. The modern rifleman is seldom surprised in this respect.'

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(Based upon the Presidential Address to the Yorkshire Naturalists' Union, delivered at the Leeds University)

By THOMAS SHEPPARD

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This work has been considerably extended, and occupies over 200 pages. It contains an account of the various scientific publications issued from Ackworth, Addingham, Barnsley, Ben Rhydding, Beverley, Bradford, Doncaster, Driffield, Goole, Halifax, Harrogate, Haworth, Hebden Bridge, Huddersfield, Hull, Idle, Ilkley, Keighley, Leeds, Malton, Middlesbrough, Pocklington, Pontefract, Ripon, Rotherham, Scarborough, Sedbergh, Selby, Settle, Sheffield, Wakefield, Whitby and York. In addition there is an exceptionally complete bibliography of the various natural history journals and publications, now issued for the first time. The author has been successful in obtaining many publications not in the British Museum.

EXTRACT FROM PREFACE:—

In the following pages an effort is made to indicate the various sources of information likely to be of service to a student in his work on any branch of natural science dealing with our broad-acred shire. The section arranged topographically under towns shows what has been accomplished in each place, while the remainder of the book is devoted to an enumeration of the general sources of information which should be consulted. Unfortunately, several of the items are scarce, in many cases only one set being known, a circumstance which has induced me to give the bibliographical details rather fully. By a series of fortunate circumstances, and as a result of several years' collecting, I possess sets of most of the publications mentioned, and shall endeavour to arrange that they remain intact for the benefit of future workers, as it will certainly be very difficult, if not impossible, to get such a collection together again.

It is also hoped that the bibliographical particulars of the various journals and Societies' Transactions will be of service to librarians and others who often find it difficult to trace items of this character. I believe they are now given in this form for the first time.

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NOTES AND COMMENTS.

RECOGNITION OF NATURAL HISTORY WORK.

The word 'research' has recently become so intimately connected with our great universities, that the conscientious work of the amateur field naturalist is apt to be almost overlooked, even by the greater seats of learning which often depend so much on the work of the field naturalist for the basis of their researches. Such a charge cannot be laid at the doors of the University of Leeds, which has so generously appreciated the work of the Yorkshire Naturalists' Union by conferring the degree of Doctor of Science upon one of the Union's past presidents, and the degree of Master of Science upon others of the Union's prominent workers.

A 'FIELD DAY.'

July 3rd can be recorded as a real 'field day' for Yorkshire naturalists, who packed the great hall at the University to witness the impressive ceremony on that occasion. All felt that the Union had been greatly honoured by the University, and the honour is certainly appreciated. Below we reprint the addresses given by the respective Professors on presenting the candidates to the Chancellor, the Duke of Devonshire. Professor Cohen introduced Mr. Harold Wager; Professor P. F. Kendall presented Mr. Sheppard; and the others were presented by Professor Garstang. Personally we consider that some of the remarks were exceedingly encouraging and flattering, and one member was heard to remark that they savoured of premature obituary notices! However, we are pleased to preserve the addresses in the Union's official organ.

THE LEEDS UNIVERSITY AND YORKSHIRE NATURALISTS.

In introducing the members of the Yorkshire Naturalists' Union to receive honorary degrees, Professor Garstang, stated: The study of nature cannot be restricted within the walls of universities and laboratories. Certain aspects of the subject, it is true, can only be effectively pursued under these conditions, but there are vast fields of knowledge only to be garnered by outdoor study. These fields are open to all, and Britain is distinguished among all the countries of the world by the abundance of the scientific work carried out, and the value of the discoveries made by her long succession of distinguished amateurs. Yorkshire has ever been to the fore in this spontaneous growth of scientific zeal, and in the Yorkshire Naturalists' Union we have one of the most striking examples of organised effort to explore the fields which lie open for investigation in a great and varied locality. In the forty local

societies of natural history included in the Union, there are several thousands of members who devote an appreciable portion of their leisure time to the study of various aspects of nature, largely by co-operation in the meeting and in the field. The University of Leeds appreciates highly these evidences of a wide diffusion of intellectual interests in the county, and in seeking to enrol among its Honorary Graduates the distinguished naturalists who are here to-day, it honours no less the much larger number who have helped them to guide and increase the love of learning and investigation in their various localities.

HAROLD WAGER.

From his boyhood, Mr. Wager has been a devoted lover and student of nature. Inspired by the teaching of Huxley, under whom he studied, and later by Scott, with whom he worked, he turned his attention to natural science. Research has been the keynote of his life's work. Neither his duties as demonstrator and lecturer in Botany in our Yorkshire College, a position which he held with distinction for six years (1888-1894), nor his later more unsettled and arduous life as His Majesty's Inspector of Secondary Schools, have diverted him from his eager study of biological problems; a pursuit which he has carried on uninterruptedly for 30 years. He is the author of memoirs and papers on various botanical subjects concerning the structure and physiology of the lower organisms and their modes of growth and reproduction, and the structure and life history of the yeast plant, the response of plants to light, the function of chlorophyll, and the behaviour of microscopic organisms under the influence of gravity. The value of his contributions to science has been recognised by the Royal Society, who elected him to the fellowship in 1907, and by the committee of the British Association, who made him president of the botanical section in 1905. He has filled the presidential chairs of the British Mycological Society and of the Naturalists' Union, and is a member of other scientific societies, where his single-hearted devotion to science, his keen powers of observation and of lucid exposition are widely recognised, and serve as an inspiration and encouragement to others.

THOMAS HUDSON NELSON.

Thomas Hudson Nelson is the biographer of the Birds of Yorkshire. The grandeur of Yorkshire in the extent and variety of its surface, in its moors and dales and forests, and in its sea-worn cliffs and headlands, and in its sandy bays and tidal estuaries, has provided problems of endless scope for the ornithologists, and it has needed a succession of many ardent naturalists to build up the material for a full representa-

tion of the bird life of our county. Upon T. H. Nelson fell the mantle, now many years ago, of a distinguished predecessor, who left the county before his work in this respect was finished, and it is to Thomas Nelson that we owe one of the most important and reliable county histories of birds ever published. This work expresses the very spirit of co-operation which prevails among our Yorkshire naturalists, full of the detail which the student of birds requires concerning their local distribution, their periodic wanderings and casual movements, enriched by friendly helpers with many a charming photograph of their favourite haunts and nesting sites, the work of a master of his subject, surrounded by helpful friends in every Riding, and bringing to a clear issue the comprehensive results of long and loving studies by many hands.

WILLIAM DENISON ROEBUCK.

William Denison Roebuck is the pioneer and organiser of the systematic survey of the county, the man of method, insistent upon the guarantees of accuracy and completeness, the keeper of our records, a student of many-sided interests and of indefatigable perseverance. Joint author of the standard handbook of the Vertebrate Fauna of Yorkshire, his versatility extends to an intimate knowledge of our Bees and Butterflies, our Slugs and Snails, and of many other classes of our native fauna. Impressed, however, at an early date with the importance of co-operation and method in order to secure the fullest and most reliable results from local amateur effort, William Roebuck set to work some forty years ago to re-model the federation of our local societies of Natural History on broader and more effective lines, and both the constitution and the working of the Yorkshire Naturalists' Union as it exists to-day, embracing some 40 local societies, with a membership of several thousand naturalists, are largely due to his suggestion and initiative. The reconstitution of the Union, of which he was Honorary Secretary for nearly thirty years, resulted in a great impetus to systematic scientific investigation all over the county, and in the publication of numerous important memoirs and books on various branches of Yorkshire Natural History. Much of Roebuck's best work has been done in connection with the Leeds Naturalists' Club, the members of which owe much to his foresight and tireless service, and honour him as one of their most distinguished members.

THOMAS SHEPPARD.

Mr. Thomas Sheppard is well-known throughout Yorkshire as an untiring and prolific worker in the fields of Geology and Archæology, whose expositions on the lecture platform, lucid

and precise, lose nothing of force from the wit that ever enlivens them. Engaged in youth in the clerical work of a great railway administration, he yet early won distinction in the investigation of the traces of the Ice Age that are so amply displayed in this great county. His versatile mind now finds scope for wider activities in the control of three splendid museums in the city of Kingston-upon-Hull. Not content with the exacting demands such a post makes on his strength and energy, he added to them for many years the arduous duties of Secretary to the Yorkshire Naturalists' Union. His eminent services in this capacity received the recognition of election to the presidential chair, which he occupied at the annual meeting held within the walls of this University last December. As editor of *The Naturalist*, now and for many years he has led that journal on a career of steadily widening influence. The range of his original work in geology is wide, and its penetration deep. Possessing the pen of a ready writer, his books have had a notable effect in awakening and maintaining interest in his favourite studies.

JOHN WILLIAM TAYLOR.

John William Taylor is one of our greatest living authorities on the Land and Fresh Water Mollusca. He founded, and edited for many years, the ' Journal of Conchology,' and contributed to it numerous papers of importance. His ' Monograph on the Land and Fresh Water Mollusca of the British Isles,' on which he has been engaged for many years, is, perhaps, the best and most scientific work on this branch of science, as it certainly is the most comprehensive. It has been received with the most cordial appreciation by naturalists all over the world, who speak in the highest terms of praise of its extensive and exact learning, its scientific insight, and the beauty of its illustrations. In the preparation of this work Mr. Taylor's observations and experience led him to generalisations on the centre of distribution of life in all forms, and to the formulation of an original hypothesis which seems to give a new clue to the right understanding of problems of the distribution of both animal and vegetable life. This was elaborated in an address delivered to the International Entomological Congress at Oxford, and was later taken as the basis of his Presidential Address to the Yorkshire Naturalists' Union. Mr. Taylor's Monograph is still unfinished. The University of Leeds offers him its congratulations on the large portions already published and a sincere hope that, in spite of his threescore years and ten, he may enjoy health and strength to complete the great undertaking to which the leisure hours of his busy life have been so successfully devoted.

JOHN GRIMSHAW WILKINSON.

John Grimshaw Wilkinson has made himself an acknowledged authority upon Systematic Botany. Triumphing by perseverance and enthusiasm over an early affliction of total blindness, he has obtained an extensive and exact knowledge of the general structure of plants, both British and foreign; and he possesses a critical insight into the systematic classification of British flowering plants and ferns, and their geographical distribution. He has an intimate knowledge of the songs of birds, being able by his exquisite sense of hearing to distinguish may a subtle feature ordinarily unrecognised. For some time he was President of the Leeds Naturalists' Club, and did much valuable work in connection with its botanical section. His services, we understand, have often been of assistance to the Leeds City Council in the selection of the trees which have been planted in and around Leeds, and it is largely due to him, we believe, that our public gardens and parks are adorned with so many interesting and beautiful trees and plants. In the autumn of his modest life, so nobly lived, may we not, with honour to our seat of learning, extend to him the hand of fellowship and sympathy, expressing to him, in the words of the poet of nature, the encouragement of spring?

> '. . . . . While my hand exults
> Within the bloodless heart of lowly flowers
> To work old laws of love to fresh results,
> Thro' manifold effect of simple powers—
> I too would teach the man
> Beyond the darker hour to see the bright,
> That his fresh life may close as it began,
> The still-fulfilling promise of a light
> Narrowing the bounds of night.'

THOMAS WILLIAM WOODHEAD.

In Thomas William Woodhead we welcome a colleague in one of our affiliated institutions, the Technical College at Huddersfield. As a Biologist his investigations have covered a wide field, always fruitfully, while his numerous and important memoirs in the department of Plant Ecology and Distribution have given him an honourable position among British botanists. He has devoted special attention to the training of young teachers in the study of nature, incorporating original ideas with marked success, and spreading the spirit of scientific method into the study even of the simplest and most accessible phenomena. He has lately become an Honorary Secretary of the Yorkshire Naturalists' Union and a Joint Editor of *The Naturalist*, thus sacrificing, with characteristic generosity, the scanty leisure of a busy teacher to the service of his fellow naturalists.

NOTES ON CETACEA.

The British Museum (Natural History) has issued Dr. S. F. Harmer's 'Report on Cetacea, stranded on the British Coasts during 1914.'* It is illustrated by maps which clearly indicate the various occurrences of cetacea stranded on the coasts of the British Islands during the year. In the northern counties we notice records of Pilot Whale at Brunton Burn; White-beaked Dolphins at Amble and Redcar; Bottle-nosed Whale at Blyth; Common Porpoise at Barrow-in-Furness, Mablethorpe, Sutton-on-Sea, and Skegness.

LORD AVEBURY.†

The various books written by Lord Avebury, better known as Sir John Lubbock, are perhaps as widely read as are those of any scientific writer; not only by the person with scientific tastes, but equally by our friend, the 'man in the street.' His writings certainly had and still have a charm; the subjects he wrote about were well chosen and popular, and he seemed to be equally able to clearly express himself, whether dealing with Prehistoric Times, Wild Flowers and Insects, Ants, Bees and Wasps, the Collembola and Thysanura, Marriage, Totemism and Religion, Scenery of England, the Use of Life, Peace and Happiness, or Municipal and National Trading. His books and addresses deal with subjects as varied as can well be imagined.

A POPULAR SCIENTIST.

Lord Avebury himself probably held more honourable positions in the various scientific societies of the world than any man of his time. In addition to all this he was a most successful man in business, a rare character in a scientist. True, it has been said of him that 'bankers considered him a great scientist and men of science a great banker.' We feel sure we can say that Mr. Hutchinson has succeeded in disabusing the reader of any impression that this epigram may have suggested. Mr. Hutchinson has also succeeded in presenting a very readable and valuable record of the life and achievements of one who did his best to educate and elevate his fellow men and women. Lord Avebury, both by lectures and by books, tried to prove that, whatever happens, life is worth living, and certainly thousands of those who may have had doubts on the matter, had these doubts dispelled after reading 'The Use of Life,' or other of his books of a similar nature.

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* 4to., 16 pages, 1s. 6d.

† Life of Sir John Lubbock: Lord Avebury; by Horace G. Hutchinson, 2 vols., 338+334 pp. London: Macmillan & Co., 30s. net.

MARINE BIOLOGY.

We have received the *Annual Report* for 1914 of the *Scottish Marine Biological Association* (90 pages), which is well illustrated, and contains an excellent record of this society's work. We suppose it is more or less appropriate that by article 15 'the Association shall have a *common seal*,' though it hardly seems a strictly biological operation that it 'shall be affixed to any deed or document,' unless, of course, such document

A good collecting ground.

be the label. We reproduce one of the many illustrations which adorn the report.

ACCESSORY MINERALS IN LAKE DISTRICT GRANITES.

At a recent meeting of the London Geological Society, Messrs. R. H. Rastall and W. H. Wilcockson read a paper on 'The Accessory Minerals of the Granitic Rocks of the English Lake District.' Preliminary investigations promised results of interest if the rocks of a whole district were examined, and for this purpose the Lake District was selected. The rocks described are the granites of Skiddaw, Shap, and Eskdale, the microgranite of Threlkeld, and the granophyre of Buttermere and Ennerdale. The material was pounded in a mortar, washed, and panned, and the concentrate separated in bromoform after the removal of the magnetic portion. The general results showed a well-marked variation of accessory minerals between the different intrusions, but a similarity between parts

of the same intrusion, although the minerals of apophyses are not always the same as those of the main mass. No evidence is afforded for a genetic connexion between the different intrusions.

RARE MINERALS.

One of the most remarkable results obtained is the rarity of magnetite and the wide prevalance of pyrrhotite, which was present in every sample examined, some thirty in number. Special attention was paid to the characteristics of the zircon-crystals, which lent no support to the conclusions of Chrustchoff as to the occurrence of definite types in granite and gneiss-ose rocks respectively. In parts of both the Skiddaw granite and the Threlkeld micro-granite, anatase and brookite were found in abundance. It was not possible to determine their origin. Epidote is the characteristic mineral of the Ennerdale granophyre, while garnet is abundant at Threlkeld and Eskdale. The Eskdale granite also contains much tourmaline. The Shap granite is especially characterized by apatite and sphene.

DETECTION OF ACCESSORY MINERALS.

The method adopted by Messrs. Rastall and Wilcockson is the only way to detect the rarer accessory minerals of rocks. One of the samples which they crush down contains about 5 or 6 cubic inches, and may yield perhaps 5 or 6 minute crystals of a rare mineral like anatase. A thin slice has at most a volume of $\frac{1}{1000}$ cubic inch, and the chance of its catching one of the crystals is therefore something like one in 1000. Of specific results, the wide distribution of pyrrhotite in these Lake District intrusions is interesting.

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The Memoirs and Proceedings of the Manchester Literary and Philosophical Society, 1913-14, includes papers on 'Faunal Survey of Rostherne: Preliminary List of Lepidoptera found round the Mere,' by A. W. Boyd, and 'Juvenile Flowering in *Eucalyptus globulus*,' by Prof. F. E. Weiss.

The **Annual Report of the North Staffordshire Field Club,** Volume XLIX., recently issued, contains the usual reports of the various sections on natural history, together with notes on archæology and other matters. Among the items likely to interest our readers are: the Presidential Address, 'Staffordshire Mammals,' by J. R. B. Masefield; 'Mining Note Book of 18th Century,' by J. T. Stobbs; 'Bird Notes (1914),' by W. Wells Bladen; 'Holocene Mollusca of Letocetum,' by H. Overton. The volume is edited by S. A. H. Burne.

The Transactions of the Perthshire Society of Natural Science, volume 6, part 1, has pages 32-54, and contains the following:—'The Drought of 1913,' by C. M'Intosh; 'List of Plants in Flower in November, 1913,' by W. Barclay; '*Potamogeton trichodes*, Cham. et Schlect, as a probable Perthshire Species,' by A. Bennett; 'The Evolution of Man in the Great Ice Age,' by Dr. Lyell; 'New Perthshire Fungi,' by James Menzies.; "Further notes on Highland Rocks,' by George F. Bates. There is also an elaborate record of the Society's meetings and excursions. The report is illustrated by several plates.

OBSERVATIONS ON THE GREY SEAL.

EDMUND SELOUS.

(*Continued from page 221*).

The new-born Seal, however, was fed again. I cannot, of course, say whether this was only the second time and while it was still night, that is to say while it was still dark, except for the weak light of a crescent moon which had now risen.* Yet it was not by this light—at least not alone—that I was able to see what took place. Something, to me quite new, aided me in this, and I can now record that Seals—at least Grey Seals—are phosphorescent at night. Both the shape and the movements of the mother, as she came up the rocks, were revealed to me owing to this circumstance, and then I saw the young one, like an enlarged glow-worm, jerking itself towards her. When I say the shape, I mean only the general mass of the substance, or rather some part of it, and the outline was only indicated, and probably falsely. The light, as it seemed to me, spread outwards from some central portion, but without reaching the periphery. It was greenish or greenish white, with a blue gleam here and there. Sometimes it shone more or less brightly, and at other times, almost or quite went out. In, or as this light, I saw the young one descend from the rock on which it had been moving, and where it had before been fed, into the cleft or channel beyond its edge (a thing which I had thought quite impossible for it to do, except through accident, with death as a consequence), climb up another great block bordering this upon the other side, on which the mother now lay, and then the small fish-like form of elfish fire jerked itself up to the larger one, the two as they coincided, being in the same relative position towards each other as on the other occasions of suckling. After about the same time as before, the old Seal moved again, revealing herself clearly through her luminousness (which she had nearly ceased to do, as she lay) and I saw her thus self-light her way down the rocky channel to the sea by which she had made her approach and retirement in the evening—yesteday evening now, this entry passing into that of

October 13th.—It was perfectly evident that the luminousness of the Seals increased or decreased according to their movements or quiescence, becoming much more vivid through motion. One must, I suppose, attribute the whole effect to the water of the sea in the animal's fur, which would preclude the idea of its being under personal control. On this view, however, the young Seal must have managed to wet itself

* According to my recollection or conjecture there was certainly some small light which was not, I think, that of dawning.

where it was, on the approach of its mother, for its coat before then had long seemed perfectly dry.

From now on, I continued to watch and wait, and during the early morning light (having no watch I cannot say what o'clock it was), another feeding of this same baby seal took place. This last was all in the swirl and swell of the tide, the waves washing over the rock on which the mother lay, and often bumping her several feet out of place. As for the calf, it had often almost to swim, whilst imbibing, and once the dug it sucked had the salt wave around or upon it. This time it had a still greater climb, to get to its mother, or, rather, to its place, before she came there, and only managed it by a drop into the sea, off the rock's edge, which I should never have thought it was equal to. Then, for quite a long time, it swam about, first in the sea-pool, and then, as the tide rose and overflowed it, in the actual sea, climbing, now and again, for a little way, up on the rock, and then going back again. Here, then, is an actual demonstration that swimming in this species is instinctive, and that the young are not taught by their parents, for this one was scarce twenty-four hours old, and (unless we suppose that its mother had taken it out to sea whilst I slept), this was the first time that it had come down to the sea, or the sea had come up to it, since its birth.*

Finally the last suckling up to now, has taken place only some fifteen or twenty minutes ago. I should think it must be mid-day. The mother this time, came right up on the rock, close to where the young one was lying, and getting into position upon her side, stomach towards me, gave me a splendid view, at less, perhaps, than twelve paces distant. The thing was very interesting, for the day-old calf was not an expert, and one might almost say that though swimming lessons for young Seals are not necessary, sucking lessons are. The calf did not seem to know with exactitude where the dugs were, and, leaving the right place, was putting its head too far upwards, when the mother, several times, gently flicked its nose with her flipper—using the claws but not so as to hurt it at all—and, in this way, got it back into position. Again, after a little interval, she achieved the same result through this means, in combination with a nice placing of the dug, through the shifting and twitching of her large expanded belly. Thus, though the young one, when it found and got hold of the dug, knew how to suck it, it certainly received and seemed, to a certain extent, to require assistance in the suckling, itself,

* Yet anyone sufficiently low-down can surprise and club these young Seals, for they often lie far from the sea, and do not sufficiently understand escaping. It is to be hoped that their present protection may be made permanent, or the direct encouragement which has hitherto been given to their slaughter in the Scilly Isles will soon exterminate the species there.

as a whole. After the usual time occupied in this function the mother Seal slipped into the sea again—now almost or quite at high tide—and swam off, leaving her young one on the rocks. Thus this one calf, born on the morning of yesterday, has been fed four times as a minimum (but, in all probability, more often), between about 5 p.m. of the same date and noon to-day. How the tide was when the first suckling took place I cannot quite recall, but, I think, fairly high. Each time afterwards it was higher than the time before, and the last time almost high tide. I believe, however, that between the first and the second suckling, as witnessed by me, it must have come in full, gone back, and returned to a little beyond where it then was. The intervals between the three last times seemed to me to be about one and a half or two hours, which frequency may have to do with the recent birth of this young Seal. From the last time, however, when, I think, it was about mid-day, till I left the shed, for a little, there was no further suckling, and this represented a considerable space of time, during most of the latter part of which no old Seal appeared off the rocks. Now, however, at perhaps 3 or 4, one—I think *the* one—swims in to them, and it is to me interesting—for no sound that I could hear was uttered or made by it—that the calf, nevertheless, which has been lying quite quietly in one place, ever since my return, in such a situation that, to see anything in the sea, or the sea at all, seems an impossibility for it, owing to rocks, which rise higher than it can possibly raise its head, entirely interposing, yet begins almost from the very moment of the re-appearance, to get restless, and with a low and weak moaning, moves a little towards the tide-line, as though divining the presence of its mother. Here I may say that though the young Seals call upon their dams in the way I have described, no cry audible to me (recognising now the mistake I was previously under, as I suppose it to have been), has been uttered by any of the grown Seals, male or female.* The expected suckling now takes place. It was in full view, as also wonderfully close, and made the prettiest sight of all. The cub left off once, went on again, and then, again desisting, began to crawl towards the fore-part of its mother's body, which she tried to prevent by repeated quick flickings with her paw or flipper, but finding her child persisted, not understanding, she turned herself round on about the middle of her side, as upon a pivot,† flopped, and then slid into the water, again, and was off. As for the other and more ancient-of-

* See, however, post.

†Dr. Heatherley has described one of the young seals turning itself in this way. In both cases the rest of the body on each side, was off the rock.

days young Seal, though I have seen nothing of it, it must, I think, have been very well fed during the darkness of night, when I was for the most part asleep or trying to be, for it lies now, and has done almost all to-day, looking the picture of well-being, fat, rounded, with various twitching motions which seem to denote both bodily and mental ease and contentment. Now, however, he has awaken and begins again to call lustily, though I see no more liklihood than yesterday of his appeal being answered before nightfall.

I may mention that on the suckling before this last one, I carefully examined the body of the mother Seal, through the glasses, and saw that it was marked in various places with what seemed deep, raking claw wounds, and, in fact, could not well have been anything else. They were in sets, as it were, as one would expect were this the case, and one of three, close together, was particularly deep, and still bloody, if not quite bleeding. From this we must conclude that the female Grey Seals fight together, if they do not owe these favours to the graspings of rival males, which is perhaps more likely.

I cannot understand this young Seal. He looks as I said, yet his cries are now such as seem certainly to denote suffering, and very painful to hear. If something has happened to his dam, and he really starving, though in the first easy stages of the process, it is very distressing, the fatter the more shocking. There is nothing I can do. I have drunk all the milk, and even if I had not that would only lengthen it out.

October 14th.—It grew rough in the night, and was so rough and windy when I went out of the shed, this morning, that I did not expect to be fetched off to-day. I spent most of the morning watching the parent Seals of the first young one, whose feeding I watched the first day (last Sunday) from the tent. The two kept constantly swimming about in the little bay on the rocky shore of which the young one lay. They were often very sportive together, one of them sometimes making a quick little succession of blows at the other with its flipper—in play, as it seemed to me, for the most part, but when this happened whilst the two were close in shore, and the female, leading, seemed desirous of suckling her calf, it struck me that they were delivered in earnest, and that she cuffed back at the male to prevent his following her. Several times the pair got right into the white water of the bursting waves close on the shore, and it struck me that this had an exhilirating effect on them (as though it had been effervescing champagne) since several times—twice, at any rate, if not thrice—their little sportive mock combats broke out in it. I had observed either this or another pair acting thus on (I think) the first day I came, and then (which was not the case now) they often raised little clouds of spray about themselves. The most violent waves

(and it was rough all the time) were as nothing to these Seals. As a great green wall of water burst upon and over them, one would catch sight of their bodies in its midst, as it reared itself, (like moving flies in amber) to be lost next moment, and reappear, again, far in its rear as the mass rolled on; or, with the same insouciance, they would go forward upon the seething cataract of foam. They were like a shaped part of the water itself, with all its immunities from dangers of rocks.

I have spoken of the two sporting together, and there was a period during which something more defined and of greater import seemed to be proceeding out of this. I cannot speak with assurance, as probability may be against such an interpretation, but certainly their actions, during a lengthened period, gave the idea that copulation was proceeding. In this the male clasped the female round the neck or shoulders, lying all along her back, and in this position they floated or swam together, and once, at the least, rolled round like logs in the water. These embraces took place once or twice, as though the male had made more than one attempt before succeeding in his object, after which it appeared that they had reached their conclusion, since they were not resumed subsequently whilst I watched. They thus appeared to form a special act arising out of play more or less amatory, and not a mere part of this, which, indeed, if it had been, would have made it a very peculiar and specialised form of play.

Finally after I had watched them for, as I should think, well over an hour, the mother Seal landed and suckled her calf. She lay this time half on her side and half on her back, taking great pains to present her teats to the young one, who came down to meet her, and sucked, lying on one rock, with its head over the narrow chasm which separated it from that which its mother had chosen. Afterwards the mother moved a little farther off and reposed herself, whilst the young one retreated towards where he had come from, and did the same. When I returned some time later, the tide was more in and I could see neither the one nor the other, so assumed that both had entered the sea, as the young one had done so before. The yacht came a little after this, and I returned in it, after some time, with my friends.

(*To be continued*).

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Mr. S. Hastings has some well illustrated notes on 'the Biology of the larger British Fungi' in *Knowledge* for June.

The Lancashire and Cheshire Naturalist for June contains the first Annual Report of the Lancashire and Cheshire Fauna Committee.

The Irish Naturalist for June includes an article on 'The Long-Finned Bream (*Brama longipinnis* Lowe); an addition to the Britannic Fauna,' by R. F. Scharff.

YORKSHIRE NATURALISTS AT SETTLE.

"Give me a day.
One day with life and heart
Is more than time enough to find a world."

THESE words of Lowell rang true to those lovers of nature who assembled at Settle for the Whitsuntide excursions, for everywhere, and each day, did the pulse of nature seem to beat in unison with their wishes.

Considering the withdrawal of the usual cheap travelling facilities, there was quite a good company staying over the week-end at the Ashfield Hotel, whilst the additional influx of members on Monday helped to bring the attendance on that day to a good total. The weather was ideal throughout; glorious days of sunshine tempered by an easterly breeze of not too rough a nature. The full beauty of the spingtime was everywhere apparent, and thus the many charms which are within the confines of the Ribblesdale Valley were seen practically in their full perfection.

On Saturday, the whole party devoted attention in their respective spheres of study to Giggleswick Scars and Woods. A visit was paid to the Museum at Giggleswick Grammar School, and an inspection made of the objects obtained from the Victoria Cave at Settle.

On the following day a wide area of the district planned for investigation was explored, inasmuch as three distinct parties were concerned in the operations. One spent the morning on Cockett Moss, where the flora proved very interesting, and in the afternoon the same party visited the Victoria Cave. A second went to the prettily situated hamlet of Feizor, and then to Oxenber Woods and Scars, devoting its whole time to the phases of plant life on the limestone pavements, ultimately crossing to Wharfe Gill, a deeply cut sylvan gorge, returning back through the wooded heights down Feizor Nick and over the upland pastures. The third party, to whom the geologists allied themselves, first visited Stainforth, afterwards proceeding to the head of Crummockdale, visiting Moughton Whetstone Quarry and finishing at Austwick Beck Head. On the Monday all trained to Horton-in-Ribblesdale, first visiting Messrs. Delaneys' quarries. After leaving the quarries, progression was made through Arco Woods to Cragg Hill, where the Bala outcrop was noted, then along the valley to Helwith Moss, and back by Stainforth valley to Settle.

At the close of the excursion a meeting was held in the grounds at headquarters, Mr. E. Snelgrove, President of the Botanical Section, presiding. The usual sectional reports were given, and votes of thanks accorded to Messrs. Delaney, Ltd. for permission to visit their quarries; to Mr. J. G. Robinson, J.P., F.G.S., Mr. Wm. Ingham, and Mr. R. Hallam for the

privilege so kindly granted to visit their respective estates; and to Mr. R. N. Douglas, M.A., for permission to visit the Museum at Giggleswick Grammar School. Hearty thanks were also accorded to the divisional Secretary, Mr. J. Hartshorn, for the excellent local arrangements he had made.

On Saturday evening Mr. John Holmes gave a lecture upon the Geological features of the Settle District. Mr. J. H. Howarth, J.P., F.G.S., occupied the chair. Mr. Holmes stated that the three outstanding geological features of the Settle district were the Millstone Grit on the south, the Great Scar Limestone between the southern and northern branches of the Craven Fault, and the Silurian track from Stainforth to Horton.

These features were dealt with in detail, and their characteristics pointed out in a very lucid manner. At Settle itself the Craven Fault has brought up the Great Scar Limestone to a height of several hundred feet above the Millstone Grit, and this prominent feature extends from beyond Austwick to Attermire, a typical limestone tract with very little drift. Further north, at Stainforth, the Silurian rocks representing an older formation than the limestone, are brought nearly to the same level as the limestone scar. Mr. Holmes briefly outlined the notable geological features which would be met with on the route traversed on Whit Monday. The chief of these were the Ingletonian Rocks at Horton, the Bala Limestone at Cragg Hill, the Austwick Grits and the Horton Flags. The formation of the Ribble Valley and the glaciation of the district were also shortly discussed. Several maps and diagrammatic drawings were also exhibited by Mr. Holmes. A discussion followed.—W. E. L. W.

Vertebrate Zoology.—Mr. Rosse Butterfield writes:—The most interesting bird I noticed was the Grasshopper Warbler on Austwick Moss. On the same moss and Lawkland Moss the Sedge Warbler and Reed Bunting were noticeably common. The Golden Crested Wren was seen in the pinewoods overlooking Austwick Moss. Owls frequented the wood as was shown by the pellets. On previous visits I have seen the Long-eared Owl here. The Redstart was common in all the wooded parts. Frequenting the screes several Kestrels were observed. The Wheatear was quite at home nesting in the limestone walls in the high summit over Settle. The Curlew, Redshank, Snipe, Yellow Wagtail, Ring Ouzel and Meadow Pipit were seen in all likely places, and nests of some were found.

On Helwith Moss a young dead Coot was picked up. The woods at Horton-in-Ribblesdale were tenanted by the characteristic sylvan birds in North-West Yorks, a special feature being the abundance of Spotted Flycatchers.

Mr. H. B. Booth informs me that Mr. G. Bolam visited the district during the Union's excursion, and reported seeing the Stonechat. This is a most interesting record, and one which the Bradford naturalists have tried to establish for many years. It has frequently been reported for the North-West portion, but hitherto, so far as I am aware, without success.

Conchology.—Mr. Thomas Castle writes :—The sunny and dry weather did not favour the Conchologists. The dusty condition of the roadside vegetation, due to the abnormal motor traffic, and the dry condition of the ground in the wooded areas (except in very shady places), also militated against record making, so that several species previously found in the district were not confirmed on this visit, though additions were made. The varied geological formations covering the area traversed should, upon persistent search, considerably extend the species known for the district. The Giggleswick School museum should be enriched by the addition of local specimens of land and fresh water shells, as they would also be useful as permanent records of the mollusca occurring in the district of Settle.

The land shells noted were :—

Helix aspersa.
H. nemoralis.
H. ericetorum.
H. rufescens.
H. rotundata.
H. rupestris.
Hyalina nitidula.
H. cellaria.
H. crystallina.
H. pura.
Bulimus obscurus.
Cochlicopa lubrica.
Pupa ringens.
Clausilia rugosa.
C. dubia.
Vitrina pelucida.
An undetermined species of *Vertigo.*

The freshwater species noted were :—

Limnea peregra, the long spine form in pond near the Victoria Cave ; the short spine form in river Ribble ; young growth in many smaller ponds and wells, including the Ebbing and Flowing Well.

Limnea truncatula in the river Ribble.

Ancylus fluviatilis, common, and of good form in river Ribble.

An undetermined species of *Pisidium* was found on Cocket Moss.

Hymenoptera.—Mr. R. Butterfield writes :—In spite of the sunny weather, an easterly wind proved unfavourable for collecting hymenoptera. The social bees and wasps were not uncommon, but solitary species were scarce. Of the social bees, *Bombus soroensis* was the most interesting. *B. terrestris, B. lapidarius* and *B. hortorum* were well distributed. Among the wasps, both the species which nest in trees were captured. A single example of the rare *Audrena lapponica* Zett. was caught.

Flowering Plants.—Mr. J. Hartshorn writes:—Some species, as the Bog-Bean, were not as conspicuous as they will be later when the season is more advanced, and in this respect the time of flowering of *Thlaspi alpestre*, seen in pastures near the "Celtic Wall," may be noted. Here the plants were only coming into bloom whereas on Wensleydale the var. *occitanum* was in bloom this year in April 10th. Confirming the record in the 'Flora Cravoniensis,' *Cardamine impatiens* and *Andromeda polifolia* were found, the latter in two stations. In one of these there were Lily of the Valley, Herb Paris, Solomon's Seal and the Horse-shoe Vetch, with *Allium vineale* near, by the roadside.

Other interesting species seen were:—

Columbine.
Trollius europaeus.
Draba incana.
Arenaria verna.
Silene maritima.
Viola lutea.
Mares-tail.
Sundew.
Melancholy Thistle.
Primula farinosa.
Utricularia vulgaris.
U. minor.
Polygonum viparum.
Myrica gale.
Sparganium natans.
Shoenus nigricans.
Melica nutans.
Sesleria caerulea.
Juniper, plentiful in 'Juniper Valley.'

The Ferns noticed were:—

Hayscented Mountain Fern.
Bladder Fern.
Green-Stemmed Spleenwort.
Black Stemmed Spleenwort.
Beech Fern.
Moonwort
Adders-tongue.

Geology.—Mr. John Holmes writes:—On Saturday, the geologists walked from Settle to Giggleswick Scars along the line traversed by the southern branch of the Craven Fault. Here, on the right, the Great Scar Limestone rises to a height of several hundred feet, while below, on the left, are Millstone Grits. The Ebbing and Flowing Well was visited, but owing to the drought the 'ebb and flow' had ceased.

At the foot of Buckhaw Brow the party crossed the road to examine the shales and grits on the downthrow side of the fault. No fossils were found, but lithologically the beds resemble the Kinderscout Grits.

On the way to Smearside the limestone pavement on the top of the scars was examined. This area has been glaciated, but, with the exception of a few isolated Silurian boulders, little drift material remains. After visiting the supposed Celtic Wall, the party left the scars by a 'dry valley,' near Stackhouse, and returned to headquarters.

On the following day, a small party of geologists joined the botanists who were investigating the flora of the Pre-Carboniferous Rocks of the district. The full length of the Crummock valley was explored, and its geological structure explained by the leaders.

At Horton, on Monday, the Grits and Conglomerates of the Ingletonian Series were examined in the bed of the Ribble at Row End, and in Messrs. Delaney's Quarry near the station. At the latter place they are worked below the level of the ground to a depth of 100 feet. The beds of the Ingletonian Series are probably the oldest strata exposed in the county. Mr. Rastall, who has made a detailed stratigraphical and petrological examination of these rocks, has arrived at the conclusion that they are of Pre-Cambrian age, and the materials from which they have been formed were derived by denudation from an area of igneous rocks. In the upper part of Messrs. Delaney's Quarry the Great Scar Limestone is worked for lime-burning. Owing to the lower beds not being worked, the junction between the limestone and the Ingletonian is not seen.

South of Horton the Ingletonian Series is succeeded by Ardovician and Silurian Rocks, which have bent into a series of folds with their axes striking N.W. and S.E. These folds were denuded to an almost level surface before they sunk below the waters to form the sea floor upon which the limestone of Moughton Fell was deposited. Near Garth House, and again under Horton Wood, the Austwick Grits were seen in a double synclinal, and at Cragg Hill, the Bala Limestones and shales with the lower beds of the Silurian bent over them. A few corals and brachiopods were collected from the weathered limestones.

Near Cragg Hill, on the south side of the anticlinal, an outcrop of the Moughton Whetstone was found. This curiously coloured rock is found on the north side of the fold in the Crummock Valley, and is used locally as a whetstone. The Horton flags occupy the trough of the fold south of Cragg Hill, and appear on the surface for a distance of two miles. The unconformity between the Silurians and the Carboniferous Limestone is clearly seen at Arco Wood, and at Combe Quarry, where the flags have been quarried back to the face of the limestone which rests upon their upturned and denuded edges. Worm tracks were noticed in the flags at Combe Quarry. Actinocrinus was found at Dry Rigg, and Orthoceras at Helwith Bridge. Helworth Moss was visited, and a section of peat 6 feet thick was seen. On the way down the river bank, Stainforth Force was passed where some excellent examples of 'pot-hole' formation were seen in the limestone bed of the stream.

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From Mr. J. Wilfrid Jackson we have received a 'Report on the Animal Remains found at the Roman Fort at Manchester,' and also a reprint from the *Annals and Magazine of Natural History* dealing with the 'Degeneration in the Teeth of Oxen and Sheep.' The latter is based upon an examination of specimens from Derbyshire, Yorkshire, Lancashire, etc.

YORKSHIRE NATURALISTS AT HAMBLETON, NEAR SELBY.

GLORIOUS weather favoured the Union's visit to Hambleton, near Selby, on the third Saturday in June, and no doubt this was partly the cause of the excellent attendance, which constituted a record for the present year's excursions. With one exception all the Sections were well represented, and despite the heat, there was no lack of zest in the work put forth within the area of investigation, and if the dry conditions proved unfavourable to workers in certain sections, they had recompense from the beauties of nature on every hand apparent.

Yorkshire Naturalists at Hambleton.

The general body of naturalists devoted the whole of its time within Bishop Wood, an area of ground covering about eight hundred acres, which, according to records, has been devoted to the cultivation of timber since Tudor times. It is one of the largest indigenous woods in the county, and to entomologists in particular has long been considered classic ground for their sphere of study. The wood is exceedingly well timbered, and although the oak is the dominant tree, there is an excellent admixture of other woodland trees. To the older members present pleasant memories were revived, inasmuch as Bishop Wood was first investigated by the members of the Union practically thirty-seven years ago, that is, in August 1878.

Permission to visit the wood had been kindly granted by Mr. J. Elston Cawthorn, who, with his woodmen, accompanied the party. At noon Mr. Cawthorn invited the members to partake of an excellent lunch, and hearty thanks were accorded to him for his hospitality on the motion of Dr. Corbett, seconded by Mr. W. N. Cheesman.

The geologists proceeded to Brayton Barff, where Mr. Bruce McGray, the manager of the Selby Council's Waterworks, exhibited a series of cores obtained at the time the test was made for the present water supply on the Barff. He also produced for inspection a plan of the waterworks bore in Ousegate in

Jaws and Geologists at Hambleton.

1854, and a coloured drawing showing the outer strata between Brotherton and Selby, prepared by Prof. Kendall. A detailed examination was also made of the gravels and pebbles, and altogether a most instructive time was spent.

At the meeting held at the close of the excursion, the President (Mr. Riley Fortune, F.Z.S.) moved a resolution congratulating those members of the Union who had been honoured by the Leeds University by the conferring of honorary degrees (see *The Naturalist* for June, p. 181). This resolution was seconded by Dr. Corbett, and carried with acclamation. The various sectional reports were presented, and the meeting brought to a close with a vote of thanks to Mr. J. E. Cawthorn

for permission to visit the wood, to the manager of the Selby Waterworks, to Mr. Cheesman for making the local arrangements, and to Mr. J. F. Musham and Mr. W. Reeston for acting as guides to the geological party.—W. E. L. W.

Vertebrate Zoology.—Mr. E. W. Wade and Mr. A. Haigh-Lumby write :—Considerable attention was given to the edge of the wood, and the keeper's gibbets were also examined. Mr. Cawthorn informed us that there is a winter roost of the Rook in the wood, although no birds nest in the vicinity. This, of course, is contrary to the usual experience. Two members of this section report that the previous week they had seen nests of the Hawfinch, Chiff-Chaff and Goldfinch, but these escaped our vigilance. The species noted were :—

Mammals.

Hare.	Mole.	Stoat.
Hedgehog.	Rabbit.	Long-tailed Fieldmouse.
Weasel.		

Birds.

Song Thrush.	Blackbird.	Whinchat.
Redbreast.	Whitethroat.	Lesser Whitethroat.
Blackcap.	Garden Warbler.	Gold-Crested Wren.
Willow Wren.	Hedge Sparrow.	Great Titmouse.
Coal Titmouse.	Blue Titmouse.	Long-tailed Titmouse.
Common Wren.	Yellow Wagtail.	Meadow Pipit.
Tree Pipit.	Swallow.	Martin.
Greenfinch.	Common Sparrow.	Tree Sparrow.
Chaffinch.	Linnet.	Common Bunting.
Yellow Bunting.	Reed Bunting.	Skylark.
Common Jay.	Rook.	Hooded Crow.
Carrion Crow.	Common Swift.	Common Nightjar.
Great Spotted Woodpecker.	Cuckoo.	Barn Owl.
	Sparrow Hawk.	Common Kestrel.
Ring Dove.	Turtle Dove.	Moorhen.
Lapwing.	Common Redshank.	Tree Creeper.
Woodcock.	Spotted Flycatcher.	Pheasant.
Magpie.	Partridge.	

Fishes.

Roach.	Trout.	Minnow.
	Stickleback.	Eel.

Conchology.—Mr. Greevz Fysher writes :—The Conchological section was represented by Mr. John Taylor, Mr. W. Denison Roebuck and myself. The dry conditions were not conducive to molluscan research. Much time was spent along a portion of the Hambleton Dyke, and also the Duckpond in the wood. The following species were recorded, viz. :—

Arion ater.
A. ater var. *plumbea.*
A. ater var. *castanea.*
Agriolimax agrestis.
A. lævis.
Hyalinia fulva.
Hyalinia crystallina.
H. radiatula.
Helix nemoralis var. *libellula* (ooooo).
H. cantiana.
Hygromia hispida.
Helicella caperata.

Helicella virgata.
Pyramidula rotundata.
Succinea putris.
Zua lubrica.
Valvata piscinalis.
Bythinia tentaculata.
Limnæa peregra.
Physa fontinalis.
Aplexa hypnorum.
Planorbis corneus.
P. albus.
P. carinatus.
P. marginatus.
P. leucostoma.
Sphærium corneum.
Pisidium milium.

Lepidoptera.—Mr. B. Morley writes :—The fame of Bishop Wood is well-known to the ardent entomologist, but on the date of the excursion nothing of outstanding rarity was noted. The following were the species met with, and many of these were scarce, viz. :—

Imagos of

Pieris brassicæ.
P. napi.
P. rapæ.
Vanessa atalanta.
Epinephele janira.
Euchelia jacobææ.
Euclidia mi.
Tephrosia punctulata.
Abraxas ulmata.
Eupisteria obliterata.
Melanthia albicilata.
Melanippe montanata.
M. fluctuata.
Camptogramma bilineata.
Cidaria russata.
Cidaria silaceata.
Emmelesia albulata.
Tanagra atrata.
Scoparia ambigualis.
Hydrocampa nymphæalis.
Crambus hortuellus.
Cnephasia musculana.
Ptycholoma lecheana.

Larvæ of

Thecla quercus.
Dicranura vinula.
Orgyia antiqua.
Diloba cæruleocephala.
Hybernia aurantiaria.
H. defoliaria.

Neuroptera and Trichoptera.—Mr. G. T. Porritt writes : —For some inexplicable reason the wood proved very disappointing to the entomologists, and did anything but maintain its reputation of years gone by. Among Trichoptera and Neuroptera nothing of the least rarity was noted, and many usually common wood species seemed to be quite absent. Trichoptera were represented by *Phryganea striata, Limnophilus flavicornis* and *L. auricula,* the last being very abundant. Of Neuroptera, the Chrysopidæ were in good numbers, *Chrysopa perla, alba, aspersa* and one or two others. Dragon-flies were represented by the common *Agrion puella* and *Ischnura elegans. Nemoura variegata* and sundry species of *Hemerobius* and *Psocus* complete the list.

(*To be continued*).

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Mr. Arthur Whitaker has a well illustrated paper on ' The Long Eared Bat,' in *Wild Life,* Vol. VI., No. 3.

We have received part 2 of *The Australian Zoologist,* which contains the report of the Council of the Royal Zoological Society of New South Wales ; ' Bird Notes,' by W. W. Froggatt ; ' Two New Australia Beetles,' by W. J. Rainbow ; ' The Migration of the Jolly-Tail or Eel-Gudgeon,' by A. R. McCulloch ; and the Genus *Tisiphone* by G. A. Waterhouse.

MUSEUMS AND EDUCATION.

In view of the conditions prevailing, the Council of the Museums Association did not consider it advisable to hold the usual week's conference this year. As there were one or two matters of urgency, however, it was decided to hold one day's meeting in London, on Wednesday, July 7th ; and on the 8th the various curators were invited to meet a special committee of the British Association for the Advancement of Science, to consider some suggestions for better relationships between museums and educational authorities. While it was found that many of the suggestions made by the British Association (such as lectures to scholars, lectures to the public, assistance to art students, loans to schools, etc.) have already been carried out at several museums, without extra assistance in the way of staff or funds, one or two points were raised that are worthy of consideration.

The attendance was remarkably good, and the delegates were welcomed by the Director of the Victoria and Albert Museums, Sir Cecil Smith.

While in the National Museums the curators had an excellent opportunity of seeing what was being done in those great institutions towards special protection against fires, etc., as well as upon many other points connected with museum administration.

Dr. F. A. Bather (British Museum) spoke on the ' Museums and the War ' ; Mr. W. R. Butterfield (Hastings) dealt with ' The Museums and the National Cause ' ; Mr. G. W. Prothero, of the Central Committee of National Patriotic Organisation, also spoke on the same subject. Several suggestions were made as to ways in which museums might be more useful in the present crisis, such as assisting recruiting by special exhibitions of various military and naval relics, uniforms, badges, war medals, relics from past wars, etc.

It was pointed out by Mr. H. Bolton (Bristol) that hitherto, on account of quality and cheapness, the supply of glass jars, iron trays, and several other necessary museum appliances, had been obtained from Germany. A committee was formed for the purpose of ascertaining the possible requirements of the various museums of Great Britain, and of approaching British manufacturers with the object of meeting these requirements at a cheaper rate than has obtained in the past. It was felt that this would be possible if all the orders were placed in one channel, instead of being given independently by each institution as at present. This committee, however, will issue its report in due course.

Dr. F. Grant Ogilvie presented a paper on ' Some Sections of Museum Collections illustrative of Science.' This aspect of

museum work is admirably shown in the Scottish National Museum at Edinburgh, which was explained to the members by Dr. Ogilvie at the Edinburgh meeting some years ago. The present seems a particularly opportune moment to extend the technical side of museum work by the exhibition of models of machinery, etc.

After lunch the members adjourned to the Natural History Museum, South Kensington, where Dr. S. F. Harmer gave the results of some systematic experiments made with regard to the fading of museum specimens exposed to light. Various types of object, zoological and botanical, were exposed to different lights, natural and artificial, direct and diffused, under various kinds of glass, and the results were most marked. In some cases the colour had entirely faded in twelve months ; in others very little, if any change, was noticeable. Full advantage of these elaborate tests will doubtless be taken by those in charge of provincial museums. Methods of preserving flowering plants, sea-weeds, etc., with the natural colours, were described by Dr. Rendall, by Mr. Tate Regan, Dr. Smith Woodward and others, and in this way the smaller museums reap the benefit of experiments, sometimes very costly, made by the National Institutions.

Mr. H. H. Peach (Leicester), read a paper on ' The Design and Industries Association and the Museum.' He pointed out many ways in which museums might help the local arts and crafts, and drew attention to the deplorable manner in which such encouragement was frequently neglected in local museums. He advocated the proper exhibition of objects to illustrate present and past woodwork, iron-work, needle-work, basket-work, embroidery, toys, etc. It was shown that in many cases local trades and industries had entirely disappeared in recent years as a result of foreign competition, but that there was now an opportunity of reviving many of these, and to a large extent museums were in a position to encourage this revival.

Prof. W. R. Lethaby, of the Royal College of Art, made some interesting remarks from the point of view of a ' Museum Lover.' He took up the attitude of the ordinary educated visitor, and, in humorous vein, pointed out many ways in which the exhibition, classification and labelling of museum specimens may yet be improved, both from the point of view of the casual visitor, and of the more serious student.

Nurse Prior (Leicester), described ' A Children's Welfare Section in the Museum,' at Leicester, where an attempt had been made to arrange an exhibition of interest to mothers. In this were shown specimens to illustrate proper and incorrect methods of feeding, clothing, and rearing children generally, which seems to be more or less appropriate at the present time.

Particulars of the kinds of exhibits were given in great detail, and there is no question that such exhibitions are of great and practical value.

Mr. J. P. Maginnis submitted a paper on ' The Educational Value of Models,' and Mr. H. J. E. Peake (Newbury) dealt with ' A Catalogue of Bronze Implements.'

The meeting then dispersed, after a solid eight hours' session.

On the following day Professor J. A. Greene, M.A. (Professor of Education, University, Sheffield), opened a conference between the Museums Association and the British Association Committee of enquiry upon museums in relationship to education. His paper contained many suggestions as to the ways in which museums could co-operate with educational authorities, but most of these had already been carried out at many places. From the various remarks which were made it was apparent that what with lecturing to scholars and the public, the duties of the curators were increasing to such an extent that the time seems to have arrived when something should be done by way of relief. A member of the Manchester Education Committee stated that at Manchester it was felt that much of the museums curator's time was occupied by these lectures, and an arrangement had been made which was proving very satisfactory. Some of the schools there had been closed to meet the requirements of the military authorities, and teachers were therefore available. A few of the teachers who were specially able to do the work had attended the museum, and each one had, with the aid of the museum staff, prepared a lecture on a particular subject, and now the scholars were instructed by the teaching staff of the schools, and in this way the curators were more at liberty to attend to their own duties.—T. S.

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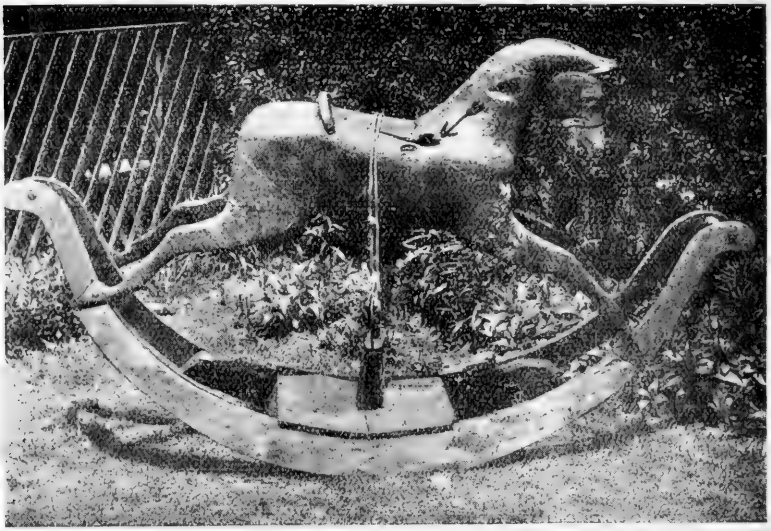
An Introduction to Geology. By **C. I. Gardiner, M.A., F.G.S.** G. Bell & Sons, London, 186 pages. In a series of twelve chapters the senior Science Master at Cheltenham College writes a very readable and well-illustrated introduction to the study of geology. He gives an account of the lives of Werner, Hutton, Smith and Lyell; then deals with ' Denudation and Deposition of the Present Time '; ' Land Elevation and Submergence and accompanying Phenomena '; The Sedimentary Rocks, Scenery, Glaciers, Caves, Coal, Volcanoes, Fossils and Maps.

Minerals and the Microscope: An Introduction to the Study of Petrology. By **H. G. Smith, F.G.S.** T. Murby & Co., London, 116 pages. This little book is written to be used in conjunction with Harker's ' Petrology for Students.' It contains a description of a Petrological Microscope, particulars of the characters of minerals in ordinary light, transmitted light, reflected light, polarised light, cross nicols, etc. There are a number of excellent illustrations of typical minerals under the microscope, and careful descriptions of the more important ones. There is a chapter on ' Refractive Index of Isolated Fragments,' and some hints on petrology.

FIELD NOTE.

BIRDS.

Curious Place for Great Tit's Nest.—A pair of Great Tits built a nest in the crupper of a rocking-horse in the



garden at 46 Brook Street, Selby (May 18th). The eggs could be easily seen.—J. F. MUSHAM, Selby.

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The Fifth Annual Report of the Doncaster Art Gallery and Museum (14 pp.), just to hand, contains record of the work of this institution during the year. It seems somewhat hampered by the want of exhibition space.

The **Annual Report and Transactions of the Manchester Microscopical Society** contains, among other items, the Presidential Address, 'Juvenile and Adult Structure in Plants,' by Prof. F. E. Weiss; 'The Microscopy of the Manchester Water Supply,' by Charles Turner; and 'The Histology of a Leaf,' by G. McKechnie.

The **Report and Proceedings of the Manchester Field Naturalists' and Archæologists' Society** for the year 1914, 90 pages, contains illustrated reports of excursions and meetings of this society, some being as far away as Leamington and Bournemouth. The reports are of a general character and contains notes on plants, birds, etc. The publication is well produced.

The Transactions of the Burton-on-Trent Natural History and Archaeological Society for Sessions 1910-11, 1911-12, 1912-13 (77 pages), edited by G. H. Storer, forming Volume VII., has just been received. Besides papers of antiquarian interest, annual reports, etc., we notice 'Our Summer Migrants,' and 'Dates of Arrival of Summer Migrants, 1911, 1912, 1913,' by Charles Hanson, jun.; 'A Visit to the Roman Wall in Connection with the Monk's Bridge,' by H. A. Rye; 'Some Bird Notes,' and 'A List of the Vertebrate Animals in the Society's Collection,' catalogued by G. H. Storer; and Meteorological Summary, 1911, 1912, 1913.

BIBLIOGRAPHY:

Papers and Records relating to the Geology and Palæontology of the North of England (Yorkshire excepted), published during 1914.

T. SHEPPARD, M.Sc., F.G.S.

The 'North of England' includes the counties of Cheshire, Derbyshire, Nottinghamshire, Lincolnshire, and to the north thereof; including the Isle of Man.

1913.

ANON (G.C. Rly.) — Yorks., Lancs., Lincs., Cheshire, Notts. & Derbyshire.

Per Rail. [Includes maps and sections of Coal-fields, etc.], pages 238+lxxvii.

A. C. HOUSTON. — Yorks., Lancs., Cheshire, etc.

Studies in Water Supply, London, pp. xii.+203.

1914.

ANON. — Notts., Lincs.

Ice-flows in the Trent Basin: Scandinavian and British Ice. *The Naturalist,* April, pp. 107-8.

ANON.

Catalogue of the More Important Papers, especially those relating to Local Scientific Investigations, published by the Corresponding Societies of the British Association during the year ending May 31st, 1913. Rep. Brit. Assoc. (Birmingham), for 1913, pp. 349-364.

ANON. — Yorks., Lancs., Lake District.

Glaciation of East Lancashire [notice of Dr. Jowett's paper]. *The Naturalist,* March, pp. 75-76.

ANON. — Lancs., Yorks.

Lancashire Naturalist [*Megalichthys hibberti* in Yorks. and Lancs.] *The Naturalist,* October, p. 303.

ANON. — Derbyshire, Yorks.

Sections of Strata of the Coal Measures of Yorkshire, together with a few Derbyshire sections compiled from Records of Borings and Sinkings. By a Committee of the Midland Institute of Mining, Civil and Mechanical Engineers, Sheffield, 303 pages.

ANON. — Lancs., Yorks.

Cross Country Sections and Map of Yorkshire Coalfield [includes map of Yorkshire coalfields showing collieries and positions of two sections, which are also given in the same cover, namely, Burnley to Pontefract, and Manchester to Doncaster]. Sheffield.

ANON. — Cumberland.

The Carlisle-Solway Basin. *The Naturalist,* July, pp. 202-3.

ANON. — Durham, Northumberland.

Scandinavian Drift of the Durham Coast; Pre-glacial Depressions; Scottish Rocks; Yorkshire Drift. *The Naturalist,* July, pp. 203-205.

ANON. Derbyshire.
The Derbyshire Coalfield. *The Naturalist*, August, p. 236.

ANON. Notts.
The Water Supply of Nottinghamshire. *The Naturalist*, August, pp. 236-7.

ANON. Lancs.
Fall of Meteor at Standish ['a fortnight ago']. *Lancs. and Cheshire Naturalist*, October, p. 243.

ANON. Lancs.
A Curious Fossil [cast of *Bellerophon cornuarietes* from Chatburn]. *Lancs. and Cheshire Naturalist*, October, pp. 260-1.

ANON. [signed 'Pro Tempore']. Lancs.
Disworth Field Club [refers to Lancashire Geology, etc.] *Lancashire and Cheshire Naturalist*, June, pp. 91-97.

ANON. Lancs.
Aerolite in Lancashire. *The Naturalist*, December, p. 361.

GEORGE ABBOTT. Durham.
Is *Atikokania lawsoni* a Concretion ? [compares with the Magnesian Limestone of Sunderland]. *Nature*, December 31st, pp. 447-8.

GEORGE ABBOTT. Durham.
Zonal Structure in Colloids [letter on; also letter from H. J. Johnston-Lavis]. *Nature*, January 29th, pp. 607-8 and February 19th, p. 687.

GEORGE ABBOTT. Northumberland, Durham.
Discoid Limestones which Simulate Organic Characters. A Case of Inorganic Evolution. Reprint from 'The Pioneer,' March 20th and 27th, pp. 8.

B. AMSDEN. Northumberland, Durham.
Report of the Field Meetings of the Natural History Society for 1910 [includes geological notes]. 'Trans. Nat. Hist. Soc. of Northumberland, Durham and Newcastle-upon-Tyne' (New Series), Vol. IV., Part 1, pp. 200-209.

H. C. BEASLEY. Cheshire.
Description of a Footprint recently found in the Lower Keuper Sandstone of Runcorn Hill. 'Proc. Liverpool Geol. Soc.,' Vol. XII., Part 1, pp. 32-34.

L. L. BELINFANTE [edited by]. N. Counties.
Abstracts of the Proceedings of the Geological Society of London, Nos. 946-962. London, 8vo., pp. 126.

Northern Counties.
[L. L. BELINFANTE] edited by; [C. P. CHATWIN] compiled by.
Geological Literature added to the Geological Society's Library during the year ended December 31st, 1912. Pages 1-266.

F. BEYSCHLAG, J. H. L. VOGT, P. KRUSCH. N. Counties.
The Deposits of the Useful Minerals and Rocks, their Origin, Form and Content, translated by S. J. Truscott. Vol. I., pp. 514.

S. GRAHAM BIRKS. Lancs. Yorks.
The Crossopterygian Fossil Fishes of this Area. I. Introductory [*Megalichthys hibberti*]. *The Lancs. and Cheshire Naturalist*, August, pp. 185-187; II., the Genus *Megalichthys*, loc. cit., September, pp. 227-236. See also *The Naturalist*, October, p. 303.

P. G. H. Boswell. Lincs.

On the Occurrence of the North Sea Drift (Lower Glacial) and certain other Brick-earths in Suffolk. 'Proc. Geol. Assoc.,' Vol. XXV., Part 3, June, pp. 121-153.

R. G. A. Bullerwell. Northumberland.

A Section of the Cliffs near Newbiggin-by-the-Sea, in which is exposed a Gravel Bed containing Chalk Flints. 'Trans. Nat. Hist. Soc. of Northumberland, Durham and Newcastle-upon-Tyne' (New Series), Vol. IV., Part 1, pp. 61-6.

J. W. Carr and H. H. Swinnerton. Notts.

Report of an Excursion to the Nottingham District. 'Proc. Geol. Assoc.', Vol. XXV., Part 2, pp. 84-89.

Gerald O. Case. Northern Counties.

Coast Sand-Dunes, Sandpits and Sand Wastes. London, pp. viii. + 162.

Frederick Chapman. Cheshire.

Australasian Fossils [gives illustrations of a Submerged Forest in Cheshire, etc.]. Melbourne, pp. 341.

C. P. Chatwin. See L. L. Belinfante.

W. G. C[ollingwood]. Cumberland.

A New Bloomery-Site in Tilberthwaite. 'Trans. Cumb. and Westm. Ant. and Arch. Soc.,' Vol. XIV. (New Series), p. 493.

T. A. Coward. See W. M. Tattersall.

A. C. Dalton. Lincs.

Geology [of Scunthorpe]. Circular 226 in 'Trans. Yorks. Nat. Union,' Part 35.

R. M. Deeley. Yorks., Notts.

Ice-Flows in the Trent Basin. *Geological Magazine*, February, pp. 69-73. *The Naturalist*, April, pp. 107-8.

W. F. Denning. Lancs., Yorks.

A Meteoric Fall in Lancashire [with list of previous English falls]. *Nature*, November 5th, pp. 258-9.

Lake District, Yorks.

Gertrude L. Elles and Ethel M. R. Wood [Mrs. Shakespear].

A Monograph of British Graptolites. Palæontographical Society Monograph for 1913, published 1914. Part 10, pp. 487-526, plates l.-lii.

John W. Evans. 'North of England.'

The Wearing Down of the Rocks, Part II., Chemical Action in Terrestrial Areas [brief reference to anhydrite and rock salt deposits]. 'Proc. Geol. Assoc.,' Vol. XXV., Part 4, pp. 229-270.

E. de Fraine. Lancs.

A New Species of Medullosa from the Lower Coal Measures [Lancashire]. 'Rep. Brit. Assoc' (Birmingham) 1913, p. 709.

C. I. Gardiner. Northern Counties.

An Introduction to Geology, 186 pages.

E. J. Garwood. N. Counties.

Presidential Address to Section C (Geology) [deals with algæ as rock-forming agents]. 'Rep. Brit. Assoc.' (Birmingham), 1913, pp. 453-472.

E. J. Garwood. Westmorland.

Some New Rock-building Organisms from the Lower Carboniferous, Westmorland [abstract of Presidential Address to Brit. Assoc.] *Geological Magazine*, June, pp. 265-271.

C. J. Gordon. Westmorland.

A Submerged Church in the River Eden. 'Trans. Cumb. and Westm. Ant. and Arch. Soc.,' Vol. XIV. (New Series), pp. 328-36.

J. W. Gregory. Cumberland.

The Structure of the Carlisle-Solway Basin, and the Sequence of its Permian and Triassic Rocks. Abstracts in *Nature*, May 14th, p. 288; *Geol. Mag.*, June, p. 287, and *The Naturalist*, July, pp. 202-3.

Alfred Harker. Cumberland.

Some Remarks on Geology in Relation to the Exact Sciences with an Excursus on Geological Time. 'Proc. Yorks. Geol. Soc.,' Vol. XIX., Part 1, pp. 1-13.

F. W. Harmer. Isle of Man, Lincs., Yorks.

The Pliocene Mollusca of Great Britain, being supplementary to S. V. Wood's Monograph of the Crag Mollusca. Part 1, Palæont. Soc. Monog. for 1913, pp. 1-200, plates i.-xxiv.

A. J. Heelis. Cumberland.

The Caves known as 'Isis Parlis.' 'Trans. Cumb. and Westm. Ant. and Arch. Soc.,' Vol. XIV. (New Series), pp. 337-42.

G. Hickling. See D. M. S. Watson.

J. B. Hill. See W. Gibson.

Wheelton Hind. Derbyshire.

***Temnocheilus derbiensis* sp. nov.** [from the Carboniferous Limestone]. 'Proc. Yorks. Geol. Soc.,' Vol. XIX., Part 1, pp. 18-19.

Thomas H. Holland. Northern Counties.

Report on behalf of the Delegates to the International Geological Congress, Canada, 1913 [refers to Coal-Reserves in British Coalfields]. 'Trans. Manch. Geol. and Min. Soc.,' Vol. XXXIII., Part 11, pp. 430-436.

John Horne. See W. B. Wright.

J. W. Jackson. Lancs.

On the Discovery of a Bloomery at Lindale Church, near Grange-over-Sands. 'Trans. Cumb. and Westm. Ant. and Arch. Soc.,' Vol. XIV. (New Series), pp. 256-61.

J. W. Jackson. Westmorland.

Report on the Exploration of a Cave at Haverbrack, Westmorland. 'Trans. Cumb. and Westm. Ant. and Arch. Soc.,' Vol. XIV. (New Series), pp. 262-271.

J. Wilfrid Jackson. N. Lancs., Westmorland.

Notes on Shell-Marl Deposits in N. Lancashire and Westmorland. *Lancs. and Cheshire Naturalist*, August, pp. 197-201.

H. J. Johnston-Lavis. See George Abbott.

Albert Jowett. Lancs., Yorks.

On the Glacial Geology of East Lancashire. 'Quart. Journ. Geol. Soc.,' Vol. LXX., Part 2, No. 278, pp. 199-231 (maps); Abstract in *Geol. Mag.*, March, pp. 138-9, also *The Naturalist*, March, pp. 75-76.

(*To be continued*).

NEWS FROM THE MAGAZINES.

Colonel C. E. Shepherd has a paper on 'The "Lapillus" in Fishes,' in *The Zoologist* for July.

There are notes on 'The Moults and Sequence of Plumages in some British Ducks,' by Annie C. Jackson, in *British Birds* for July.

In *Man* for July, Mr. W. P. Pycraft puts forward 'A Plea for a substitute for the Frankfort Base-line: with an account of a new method of drawing Skull Contours.'

The Geological Magazine for July includes papers on 'The River Tyne Drainage Area,' by Edward Merrick, and 'Marine Band in Midland Coal-Measures, Lancashire,' by R. L. Sherlock.

From Mr. T. Petch we have received a reprint of a paper on 'The Fungus-diseases of *Hevea brasiliensis*' in the *Internationaal Rubber-Congres met Tentoonstelling*, Batavia, 1914.

We notice in the 'Additions to British Conchology,' published in the *Journal of Conchology* for July, a record of *Trochus occidentalis* 'off Withernsea,' and *Littorina rudis* var. *similis* from the Isle of Man.

The Lancashire and Cheshire Naturalist, No. 86, contains many reports issued by the members of the Lancashire and Cheshire Fauna Committee. There is also a record of '*Sclerotinia curreyana* in the Ribble Valley.'

The Scottish Naturalist for July is an unusually thick number, and is devoted entirely to 'A Report on Scottish Ornithology in 1914, including Migration,' by Evelyn V. Baxter and Leonora Jeffrey Rintoul, and is sold at 1s. 6d. net.

Wild Life for July contains a well illustrated paper on 'The Home Life of the Kestrel,' by O. J. Wilkinson; 'Hobbies,' by J. G. Cornish; 'The Otter,' by J. K. Emsley; 'The Ringed Plover,' by William Farren, and 'Domestic Habits of the Little Grebe,' by Edmund Selous.

In *The Entomologist's Monthly Magazine* for July, Mr. J. Edwards has some notes on British Homoptera, which include records from Yorkshire, Nottinghamshire, and other northern stations; illustrations are given. Mr. G. T. Porritt has an interesting note on *Cymatophora or*.

In *The Entomologist's Record* for July-August (page 160), occurs the following account of some remarkable achievements of some Swiss butterflies:—'On the 14th I took six *Polyommatus amanda* below St. Triphon Quarries, in the marsh on my bit of land there; and yesterday five more, *walking from St. Triphon to Aigle Rhone Bridge by the canal* (*most were about half way there*).' We have heard of rabbits barking, but this is the first record of a butterflies' route march.

Knowledge for July, publishes some excellent illustrations of insects and of plant structure, which show the very great perfection to which photography with the microscope has been brought. Some years ago, drawings had to be resorted to in order to bring out many of the details of the objects examined, but a great deal more now can be done by photography. Advantage is taken of colour-sensitive plates, and, in the instance to which we allude, of Wratten light filters also, which allow only rays of certain colours to reach the photographic plate.

We notice that the Scunthorpe museum has secured the collection formed by the late Fred Brown of Scunthorpe. It includes many barbed and leaf-shaped arrow-heads, spear-heads, borers, drills, knives, etc., and a large series of beautifully worked 'thumb-flints,' or 'strike-a-lights,' and scrapers. The 'pygmy' flints are well represented by several hundred typical specimens. There is also a large dagger of black flint from Manton Common; several stone celts, some Roman glass beads, Roman pottery, and 17th century pipes, all found near Scunthorpe.

NORTHERN NEWS.

We notice that several Lincolnshire antiquities, collected by the late Edward Peacock, F.S.A., have been secured for the Lincoln museum.

We have received Vol. IV., part 1 of *The Botanical Society and Exchange Club of the British Isles*, being the report for 1914, by G. Claridge Druce. It occupies 108 pages, has a number of interesting plates, and is sold at 5s.

The Thoresby Society's Publication, Vol. XXII., part 3, just issued, contains an account of 'The Early Cross of Leeds,' by Prof. W. G. Collingwood, and Mr. A. S. Ellis writes on 'Yorkshire, A.D. 120, according to Ptolemy's Geography.'

We are glad to learn that Mr. H. C. Versey, M.Sc., has obtained a renewal of the scholarship awarded by the Leeds University, in order to complete his researches upon the Permian Rocks, which he has been carrying out at the Leeds University, with Prof. Kendall and Mr. A. Gilligan.

Readers of this journal will remember the interesting contributions on the birds and spiders of Rydal, made by the late Miss M. L. Armitt. We are pleased to see there is a work on Rydal by Miss Armitt in the press, particulars of which will be gladly sent on application to Mrs. Stanford Harris, Rydal Cottage, Ambleside.

At a recent meeting of the Zoological Society of London, Sir Edmund G. Loder exhibited the skull of a walrus, with record tusks, from Kamschatka. They weighed twenty-one and a half pounds, and measured thirty-six and a half inches in length, twenty-nine and a half inches from outside the gum, and nine and five-eighth inches in girth.

The Whitby Literary and Philosophical Society has issued its 92nd report. The chief item in it is the report for Meteorology by T. W. Parkinson. The Society has thirty-two members, and three honorary members. During the year a little bunting, a hawfinch, three 'Cook' prints, skin of a platypus, a map of the coast, and a view of Whitby, have been added to the collections.

We are glad to welcome part 17 of *A History of British Mammals* (Gurney and Jackson), pages 503-552, 2s. 6d. net. It deals with the Field Mouse, Hebridean Field Mouse, St. Kilda Field Mouse, Fair Isle Field Mouse, Yellow-necked Field Mouse, De Winton's Field Mouse; and is well illustrated. The question of the identification of the various species of mice is becoming more and more difficult.

The Journal of the Torquay Natural History Society (Vol. 2, No. 1, 61 pages, 1s.) contains among many others, the following items: 'The Life of a Shore Fly (*Fucomyia* (*Caelopa*) *frigida* Fln.)', Major E. V. Elwes; 'Study and Collecting of Insects in South Devon,' Dr. C. L. Perkins; 'Devon Pansies,' by Miss C. Ethelinda Larter; 'Kent's Cavern, with Plan,' and 'Relics of the Ice Age in Devon,' both by Harford J. Lowe.

We learn from a review in *The Yorkshire Post* that the Bankfield Museum, Halifax, has followed in the wake of several other museums during the past twenty years, viz., it 'has set an excellent example to other Corporation Museums and Libraries, by the issue of pamphlets dealing with particular subjects appertaining to objects exhibited within its walls.' If any other museum is thinking of 'setting such an excellent example,' it must hurry up, as there will soon be no museums left that does not publish such handbooks.

Readers of *The Naturalist* will be glad to see the following note received from Mr. George Mitchell, a member of the Vertebrate section of the Yorkshire Naturalists' Union, who is now with the British Expeditionary Forces in France. He states, 'I have several times seen a Kestrel hovering between our trenches and the Germans, absolutely taking no notice of the rifle fire, and I also saw a Common Buzzard starting to soar within 20 yards of the ground and not 200 yards behind our fire trenches!! All the birds have got quite used to the war, and one can see larks and their broods which they have reared within twenty yards of our trenches.'

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(Lecturer in Geography, Municipal Training College, Hull).

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THE NATURALIST.

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NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
THE MUSEUMS, HULL;
AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
TECHNICAL COLLEGE, HUDDERSFIELD.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

J. GILBERT BAKER, F.R.S. F.L.S., GEO. T. PORRITT, F.L.S., F.E.S.,
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IN THE PRESS.

YORKSHIRE'S CONTRIBUTION TO SCIENCE

(Based upon the Presidential Address to the Yorkshire Naturalists' Union, delivered at the Leeds University)

BY THOMAS SHEPPARD

M.Sc., F.G.S., F.R.G.S., F.S.A.(SCOT.)

THIS work has been considerably extended, and occupies over 200 pages. It contains an account of the various scientific publications issued from Ackworth, Addingham, Barnsley, Ben Rhydding, Beverley, Bradford, Doncaster, Driffield, Goole, Halifax, Harrogate, Haworth, Hebden Bridge, Huddersfield, Hull, Idle, Ilkley, Keighley, Leeds, Malton, Middlesbrough, Pocklington, Pontefract, Ripon, Rotherham, Scarborough, Sedbergh, Selby, Settle, Sheffield, Wakefield, Whitby and York. In addition there is an exceptionally complete bibliography of the various natural history journals and publications, now issued for the first time. The author has been successful in obtaining many publications not in the British Museum.

EXTRACT FROM PREFACE:—

IN the following pages an effort is made to indicate the various sources of information likely to be of service to a student in his work on any branch of natural science dealing with our broad-acred shire. The section arranged topographically under towns shows what has been accomplished in each place, while the remainder of the book is devoted to an enumeration of the general sources of information which should be consulted. Unfortunately, several of the items are scarce, in many cases only one set being known, a circumstance which has induced me to give the bibliographical details rather fully. By a series of fortunate circumstances, and as a result of several years' collecting, I possess sets of most of the publications mentioned, and shall endeavour to arrange that they remain intact for the benefit of future workers, as it will certainly be very difficult, if not impossible, to get such a collection together again.

It is also hoped that the bibliographical particulars of the various journals and Societies' Transactions will be of service to librarians and others who often find it difficult to trace items of this character. I believe they are now given in this form for the first time.

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NOTES AND COMMENTS.

AMERICAN GREY SQUIRREL.

We have received an interesting reprint from *The Field*, dealing with the ' American Grey Squirrel in Britain,' by Mr. Hugh Boyd Watt. He summarises the occurrence of this species in this country, and, relating to our Yorkshire station he says: ' At Scampston Hall, Rillington, Yorkshire, an experiment was made, I am informed, with some brought from Woburn. In a letter in *Country Life* (Oct. 17, 1914, p. 532), Mr. W. H. St. Quintin stated that about thirty were turned out, and during the first year following they could not be found to be breeding, but presently they began to multiply rapidly, as many as nine young being found in one nest. Within two or three months after their introduction one was reported to have been killed about seven miles away. They were found to be so destructive that most of them have been got rid of after three years' constant warfare.'

HARVEST MICE.

In connection with the preparation of the new British Museum catalogue by Mr. Martin Hinton, we are asked for information in reference to the distribution of the harvest mouse, *Mus minutis*. The verification is quite necessary, not only on account of the uncertainty which has prevailed, but also because it is quite possible that modern reaping machinery has exterminated him from districts where he was well-known a generation ago. Care must be taken not to confound him with other mice. He weaves his nest of grass about the size of a cricket ball, in common long grass, and is known to havesters and gamekeepers as ' the little red mouse.' Information should be sent to Mr. W. Lewis Reid, 46 Tytherton Road, Trefnell Park, London, N.

FORMS OF SAND.*

This pamphlet, which is illustrated by a series of remarkable drawings, contains an account of some interesting observations made at Redcar in 1882-3 by Sir W. W. Strickland. He states: ' Curiously enough the observations led the observer in those days to those very same dualistic and spiritual conceptions, which the intolerant religious fanatics were blowing themselves purple and apoplectic in endeavouring to impose by dilettante spiritualism and a priori dogma and assertions about a God and a will of God, which they pretended to know more about than anyone else. I have retained the reasoning that led to those conclusions as an interesting record of a transient phase of mind, long lived through. It seems unnecessary to take the

* By Sir W. W. Strickland, Bart., B.A. Malton: R. H. Smithson and Blanchard, 36 pages, 1s. 6d.

trouble to refute them. Professor Le Duc, in his wonderful book upon the production of life forms, by means of diffusion and osmotic pressure, has observed that form is the basis of life, and I may add that the laws of force and mathematics are the basis of form. This certainly opens the window to a nobler conception of nature than that it was cobbled together by a personal Creator with a consciousness—idealize it how you will—as imperfect a vehicle of truth as their own would be even were it not what it is and with sentiments as crude. But that it is possible that there may be something better than consciousness, feeling and personality, beyond the narrow sphere of these transient and unsatisfying illusions, in the absolute negation of them, is an idea inconceivable to our religious and " scientific " European owls.'

RAVENS ON BEMPTON CLIFFS.

Mr. Johnson Wilkinson has sent the following notice to the daily press :—' No doubt you will be pleased to hear that through the kindness of Mr. St. Quintin some young ravens have been set at liberty on Bempton Cliffs. It is to be hoped that no one will molest these interesting birds, but that they may have a chance of living and breeding on these Cliffs as formerly. It is considerably over a generation since the ravens bred there—one of the present climber's grandfather has shown to him where the old breeding site was (now in the sea). It may be mentioned that these birds have been added to the Protection Schedule of the 1880 Act, so that anyone killing or taking their eggs is liable to a heavy fine.' This notice was presumably issued by the Yorkshire Wild Birds' Protection Committee.

ECOLOGY OF THE PURPLE HEATH-GRASS.

In the current number of *The Journal of Ecology* there is an article by the Rev. T. A. Jefferies, F.L.S., on ' The Ecology of the Purple Heath Grass (*Molinia caerulea*).' An introductory section describes the area on Slaithwaite Moor near Huddersfield, in which the researches were carried out, and with the aid of a map draws attention to some special features of its plant associations which were carefully surveyed. Section two summarises from the biological standpoint the chief facts of *Molinia* structure, emphasising especially its well developed root system, its storage organs, its mechanical strength, and its ' acquatic type of leaf strengthened to resist the mechanical stresses of wind.' In the third section the author attempts to find the key to the extremely varied habitats favoured by the species, and discusses the relation between the grass and its closest competitors, *Nardus stricta* and *Eriophorum vaginatum*, its hold on the flushes, its relation to springs and to

surface slopes, its presence as an early invader in degenerate fields, and its development in many localities into a marginal belt. He concludes that the main factor in its distribution is the water supply, that as compared with Matt Grass it requires more water and compared with Cotton Grass it requires fresher, i.e., better aerated and less acid water. This conclusion is supported by the results of experiments on soil content and acidity, the method of determining soil acidity by titration being described. The last section deals with 'seed' dispersal, where we get a description of what is called 'sun-crack planting,' with the invasion of *Molinia* of Calluna moors and of woods with the closed association, with the plant as a peat former, and with the phenomena of retrogression. The paper is well illustrated by a map, one text figure and thirteen photographs.

PHYLOGENY AND RELATIONSHIPS IN THE ASCOMYCETES.

From Prof. G. F. Atkinson, of the Cornell University, we have received an interesting paper with the above heading, reprinted from the Annals of the Missouri Botanical Gardens. The author points out that perhaps there is no other large group of plants whose origin and phylogeny have given rise to such diametrically opposed hypotheses as the fungi. The presence of chlorophyll and the synthesis of carbohydrated from inorganic materials, are such general and dominant characteristics of plants, that many students regard them as the fundamental traits which primarily mark the divergence of plant from animal life. According to this hypothesis all plants possess chlorophyll, or were derived from chlorophyll-bearing ancestors. No one questions the origin of the chlorophylless seed plants from chlorophyll bearing ones by the loss of chlorophyll and reduction of photosynthetic organs. What is more natural then, than the hypothesis that the fungi have been derived from chlorophyll-bearing ancestors? It is not his purpose to discuss the question as to whether or not the *Phycomycetes* or lower fungi, had an independent origin, or were derived from one or several different groups of the green algæ. He considers some of the evidence which points to the origin of the *Ascomycetes* from fungus ancestry, rather than from the red algæ. Professor Atkinson's paper is accompanied by a chart showing the suggested phylogeny of the *Ascomycetes*, and there is an extensive list of literature quoted.

CURIOUS PHENOMENON IN PIGEON-BREEDING.

The late Professor C. O. Whitman, of Chicago, spent many years in the study of pigeons, and, in *Knowledge* for August, Professor J. Arthur Thomson expresses the hope that his unpublished observations will be made available. One of the phenomena which he noticed was that, if certain somewhat

distantly related kinds of pigeons be crossed, and if the eggs be taken away as fast as they are laid (so as to induce the pair to continue to lay fertile eggs), then in the spring both eggs of a clutch will usually develop into males, while in the autumn both will usually develop into females. In the transition period the first egg of the clutch usually develops into a male, and the second into a female.

BIRD MIGRATION AT SCARBOROUGH.

In *British Birds* for August is a record of unusual migration of Sea-Birds at Scarborough. The writer during the last week of June and the first week of July was daily on the Marine Drive and Piers, and on each occasion there were 'thousands of Guillemots, in small parties, numbering from half a dozen individuals up to 40 or 50 together. A steady stream of such flocks were passing all day until dusk, and almost all going in the same direction, very few returning south, and these mostly single birds. Smaller numbers of Razorbills, Puffins, Kittiwakes and Herring-Gulls were also noticable, and all proceeding steadily northwards. This migration was still continuing on July 16th, when many birds were passing, although not in such numbers as previously.'

CHANGES IN COLEOPTERA FAUNA.

In *The Entomologist's Monthly Magazine* for August, Mr. G. B. Walsh gives some 'Observations on Some of the Causes determining the Survival and Extinction of Insects, with special reference to the Coleoptera.' He explains the geological features and the physiographical changes which have taken place in the vicinity of the Humber, Tees, Wear and Tyne, which are the areas dealt with in his notes. He compares the present and past faunas of the Yorkshire Wolds, the Holderness marshes, and so on. We hardly agree with him however, in assuming that if coast erosion goes on at its present rate 'it will be only a comparatively short time to the complete disappearance of Spurn Point, with its rich store of sea-coast and sand-hill species.' As a matter of fact, the more the coast is eroded the more Spurn grows, as it is made up of material washed from the cliffs. Spurn has considerably extended during the past century.

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In sending reports of the animals and plants observed on the excursions of the Yorkshire Naturalists' Union, etc., will our contributors kindly note that it is not desirable to give lists of common species of general distribution. There is always much more material to print than we can find room for in the journal, and it is a pity to occupy space with information of this kind. As far as possible the lists should be confined to new records for the districts visited, unless, of course, there is some special reason for mentioning the species.

OBSERVATIONS ON THE GREY SEAL.

EDMUND SELOUS.

(*Continued from page 257*).

OCTOBER 15TH.—Re-embarked for the island alone. I had hoped to get away by 3 p.m., but the nominally more important things of life supervening and demanding the writing of various letters, etc., it must have been nearer six I think, when I was put ashore—for always I have no watch. I did not go near the shed, determining to confine my observations to the pair of Grey Seals and their young one last watched by me in the nearer bay. After nightfall it came on very dark, with no moon, and after having gazed into this darkness for sometime without any phosphorescent form of a Seal appearing, I desisted, made my bed, and went to sleep.

OCTOBER 16TH.—Before it was full light, I left the tent and climbed up to a rocky pinnacle overlooking the whole bay. The young Seal lay on its back on the rocks apparently asleep. The tide was then well out, but rising, and it was not until it had come a good deal farther in that one of the old Seals—I think the female—appeared. I, however, only saw it for a moment or two. I think it had just swum through the bay, giving a general glance round. In a little while I again saw it close in amongst the rocks, but once more it dived and disappeared. Then a considerable interval passed, after which it came again, but went away, almost as soon, after much the same procedure as previously noted. In a subsequent visit however, it stayed longer.

It having seemed to me before that these Seals closed their eyes when sinking, but not having been sufficiently certain to make the statement, I now paid particular attention, with the result that I certainly saw it close them several times when its head was just above water, and now again nine times just as it has sunk it, so that this seems fairly made out. The nostrils are also closed. This last may be invariable, but I should hardly think it was with the eyes. They must be re-opened, I suppose, when once the whole head is under water, but it seemed to me that the animal disliked getting any dash of the wave into them.

At this point the yacht arrived. As a result, the old Seal, which had been just about to feed her young one, went off, and the young one, as I believe, some little while afterwards, also took to the sea. That it is now quite capable of doing so is undoubted, since I saw it come out of the water on to the rocks, one or two mornings ago, though I may have forgotten to enter it. Also, in the later afternoon to-day it came into the shore

again, evidently with the idea of coming out, but again the wandering human form turned it away. Heatherley, King and myself now walked towards the farther nook of the shore, where the two young Seals, the younger of which was born now four days ago, are accustomed to lie on the rocks. As we got there one of these was being suckled. I could, it is true, only just see the body of the old Seal, but both from her attitude (on her side) and position in relation to the calf, I feel sure of the fact. But which of the two calves was it that she was suckling? I certainly took it to be the larger and older one of the two, and our skipper's son, an alert lad of some sixteen or so, when the point arose, sometime afterwards, stated positively that it was. The point, as will shortly be seen, is of interest and therefore I emphasise the fact, that this lad, without knowledge of the question at issue or having personal interest in the matter, beyond that which belongs to an eye-witness as such (which, however, would be here pretty keen), gave prompt and positive testimony to having seen and distingusihed both the young Seals, and that it was the larger of the two that was with the parent. How far the suckling had proceeded, whether it was but just begun or (as I now think) nearly over, I cannot say, for, with a view to testing the truth of the various stories—none, so far as I know, satisfactorily attested—of phocine delight in the 'concord of sweet sounds,' the gramaphone was now set going, with the instantaneous effect (to all appearance) of sending the mother into the water. Here she hung about, close in shore, with all the appearance of being pleased with the strains, but as she continued to do so after they had ceased, for a reason which will shortly appear, it will be seen that the *post hoc* here by no means implies the *propter hoc*. Meanwhile the calf that had been with the old Seal just before her flight, climbed further up upon the rock and went to sleep, lying on its back in a very comfortable looking manner, quite in consonance with the view that it had been fed. A little while afterwards the newly-born calf came into view, and, after considerable delay, the same mother Seal came in and suckled it. On the point of identity I can speak here with confidence, but I am not, it seems, entitled to feel equally sure in regard to that of the young Seal that had just gone to sleep, as described, since my notes state as follows:—'I am very sorry that I cannot say with absolute certainty that it was the calf which, at the time of our arrival was being suckled, that thus acted.' I cannot now (when copying out my notes a month afterwards) recall every detail to my memory, but since the relative sizes of the two young Seals did not allow of their being mistaken, one for the other, if clearly seen, and since there was no doubt at all in regard to the identity of the one last suckled, whilst my description

of the other one's actions certainly suggests that I saw it plainly too, the evidence is, I think, fairly good that the same mother suckled this pair of young Seals. Several times before this, whilst watching in the shed, a grown Seal had appeared off the rocks where the larger calf was lying, and once, particularly, seemed several times on the point of entering the little cove or channel running up to the point from which they were ascendable. This Seal did not look big enough for a male, and seemed to me to have a shyer manner than the one that was undoubtedly the mother of the newly-born calf,* and it always went away without landing. At that time the respective calves were well separated, but now the elder had travelled down towards the younger one, and the two were near each other. My idea is that the shed and humanity, combined, kept the mother of the earlier born calf from discharging her duties towards it, either wholly or in part, that the latter, either by chance or design, worked its way down to the younger one, whose mother then charitably suckled them both.

The last mentioned suckling was the same interesting sight as it has always been, but there was no new feature to recount. As once before, it took place half on the rock and half in the sea. During the interval between this and the last one, whilst the mother hung about outside the little cove, as one may almost call it when the tide is in (as now) the baby Seal had swum and disported there, thoroughly enjoying itself, and now, after the feeding, there was the pretty sight of mother and child swimming and playing about in it together, the little one now pressing to its mother, then swimming a little way away from her, returning and pressing up to her again—and this went on for a considerable time. Often the young one would get upon the mother's back, as she swam, or perhaps I should rather say would lie upon it, for this seemed to me more an effect of its pressing, and her sinking herself a little, than to represent an actual purpose on the part of both or either. Whether premeditated or not, however, the calf was sometimes there lengthwise for a minute or two. The calf would often roll on its back in the water, and flick up with one of its flippers, in, to all appearance, frolicsome mood, which struck me as remarkable in a thing so young. It was a sweet and lovely sight.

October 18th.—Having left the island yesterday, without anything further to enter, I returned to it to-day, in company with King and Heatherley. Whilst the latter were occupied in photography I peeped about behind the ridgeway of that part

* On her first suckling it she bore the plainest marks of recent parturition, which only went by degrees.

of the coast-line which forms here on the ————* side, during ordinary tides, three little inlets which have become now, through the present spring-tides, so many straits between rocky islets, at high water. In one of these I saw a young Seal swimming about and much enjoying itself, often on its back, with one or other flipper projecting from the water and flapped lazily and luxuriously, as before described. Before long this young one was joined by its mother and there was again the sympathetic sight of the two playing affectionately together, the young one once or twice on the old one's back, but not oftener, and it again struck me that this was not a definitely proposed thing, but that it came about sometimes more or less fortuitously. To these general frolic—or play—actions I have to add the specialised one of nosing, now several times seen by me, but before this only during or just before suckling. Mother and calf press their noses, more particularly—to some extent the whole muzzle—lightly together, and keep them thus for a few seconds. In suckling (though I have not before recorded it) this may take place as the mother and calf meet, or the mother will move her head round to the calf, in an interval of the feeding, as she sometimes raises and sweeps it a little in its direction merely to look at it. On these occasions, the initiative is all on her part but thus performed in the water it is—that is to say it was now shared by both of them. The action is very light, and is over quite quickly—like smelling a rose. It is very pleasant to witness, seeming to be full of a mutual quiet affection.

(*To be continued*).

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MOULTING OF ONISCUS ASELLUS, LINNÉ.

CHARLES MOSLEY.

While gardening on the afternoon of July 7th, my daughter Beatrice discovered a woodlouse (*Oniscus asellus* Linné.), in the act of casting its skin. The creature had taken up its position for the purpose amongst broken 'crocks,' used for potting. The process of casting the anterior portion of the skin was in operation, and we watched it to the finish. The head and the next two or three segments were still under the old skin, which, however, was very loose; apparently it had already almost left the larger surface of the body, and the animal was then engaged more in extricating the limbs, antennae, legs, etc. The old skin was very pale grey and semi-

* I must confess to not knowing whether it was north, south, east or west.

transparent, but not sufficiently so to be able to see clearly what was going on beneath. The posterior portion of the body, i.e., the last nine segments, had a very fresh look, having recently shed its portion of the old skin; that portion of the fore part which was visible, viz., the fifth, fourth and a little of the third segments, were much shrunken, giving a very curious appearance to the woodlouse. It would appear that the process of moulting is anticipated by a shrinking of the body within, which, thus contracted, leaves the old skin loosely about it and facilitates casting. Every few seconds the animal visibly contracted the frontal segments by muscular action, and in so doing pulled itself slightly out of the old skin, these periods of activity being alternated by longer periods of quiescence. This continued for about fifteen minutes, when the old skin was completely shed. The position of the woodlouse on an inclined plane caused the cast skin to drop on to the ground some inches away, therefore I had not the opportunity of ascertaining whether the animal would have regarded it in any way.

The dorsal plates of the fifth to the second segments of the discarded skin were intact, and on the underside still attached to the plates, were the 'shells' of the four pairs of legs. I could find no trace of the ventral plates, but the head clearly showed the several appendages attached thereto in the living animal—maxillæ, mandibles, antennae, etc.

That portion of the woodlouse just moulted was not colourless, but was of a brown hue, varying little in this respect from the hinder portion previously moulted, except that, as already mentioned, whilst the latter portion was bright and glossy, the former was dull, with a decided 'bloom' upon it. The dorsal plates of the 'new' portion, i.e., as far as the fifth segment, were narrower than the remainder, and were rather more convex, being curved somewhat down the sides of the body. The first four pairs of legs were very short, quite invisible from above, and obviously as yet not available for walking, as the animal pushed itself along by means of the three hinder pairs already hardened and serviceable.

At this stage I placed the woodlouse in confinement, hoping thus to have opportunity of noting its development during the succeeding days; but apparently its new quarters were not congenial, and it died.

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In an article on "Coal Smoke and Stone Work," which appears in *The Quarry* for August, it is estimated that in one year 66 millions tons of coal were carbonised in the retorts of our gas works.

In *The Lancashire and Cheshire Naturalist* for July, Mr. H. W. Robinson draws attention to many inaccuracies in the bird list published in the "Victoria Country History of Lancashire"; and Mr. W. H. Western figures some Galls on *Hieracium boreale*.

YORKSHIRE NATURALISTS AT HAMBLETON, NEAR SELBY.

(*Continued from page 266*).

ARACHNIDA.—Mr. W. Falconer writes :—The advantage of a more restricted area than usual for investigation was more than counterbalanced by the exceeding dryness, and lack of depth of débris on the ground. The latter situation produced very little, and collecting was therefore mainly confined to beating and sweeping. Generally speaking, spiders were not plentiful ; no false scorpion was seen, and only two mites, one of which, *Anystis baccarum* Linn., was fairly abundant. Of the three Epeirids mentioned in the circular, two were again met with, *quadrata* being the absentee, but in its place *Epeira sturmii* Hahn., a recently discriminated British spider, was beaten from a fir-tree. Many immature examples and one well-grown ♀ of *Epeira pyramidata* Clerck, were obtained, as also were a few spiders for which additional county records are desirable, viz., *Theridion varians* Hahn., *T. vittatum* Koch., *T. bimaculatum* Linn., *Entelecara acuminata* Wid., *Styloctetor penicillatus* Westr. and *Salticus cingulatus* Panz.

Dr. Fordham and Mr. Stainforth assisted in the collecting.

The names of the 58 species of spiders, four of harvestmen and two of mites so far yielded by the wood, are given below :—

SPIDERS.

Harpactes hombergii Scop. ♀.
Sagestria senoculata Linn. ♀s.
Clubiona lutescens Westr. ♀s.
C. reclusa Camb. ♂, ♀s.
C. brevipes Bl. ♀.
Dictyna uncinata Westr. ♂, ♀.
Amaurobius fenestralis Stroem. ♀s.
Theridion vittatum Koch. Sev. ♀s.
T. sisyphium Clerck. ♂s, ♀s.
T. denticulatum Walck. ♂, ♀.
T. varians Hahn. ♀.
T. bimaculatum Linn. ♂.
T. pallens Bl. ♂s, ♀s. ♂s., ♀s.
Phyllonethis lineata Clerck. and var. *redimita* Koch. ♂s., ♀s.
Robertus lividus Bl. ♂.
Drapetisca socialis Sund. ♀s.
Linyphia montana Clerck. ♀s.
L. peltata Wid. ♂s, ♀s.
L. triangularis Clerk. ♀s.
Leptyphantes blackwallii Kulcz. ♂s, ♀s.
L. obscurus Bl. ♂s. ♀s.
Bathyphantes approximatus Camb. ♂, ♀s.
B. nigrinus Westr. ♀s.
B. dorsalis Wid. ♂s, ♀s.
Agyneta conigera Camb. ♀.
Maso sundevallii Westr. ♂, ♀.
Gongylidium rufipes Sund. ♀s.
Erigone promiscua Camb. ♂.
E. dentipalpis Wid. ♀.
E. atra Bl. ♂.
Lophomma punctatum Bl. ♀.
Dicymbium nigrum Bl. ♂, ♀.
D. tibiale Bl ♂.
Enidia bituberculata Wid. ♀.
Dismodicus bifrons Bl. ♀.
Entelecara acuminata Wid. ♂s, ♀s.
E. erythropus Westr. ♂.
Savignia frontata Bl. ♀.
Metopobactrus prominulus Camb. ♂s, ♀s.
Styloctetor penicillatus Westr. ♂.
Cornicularia cuspidata Bl. ♀s.
Tetragnatha solandrii Scop. ♀s.
Meta segmentata Clerck. ♂s, ♀s.
M. merianæ Scop. ♀s. and imm.
Epeira pyramidata Clerck. ♀ and imm.
*E. diadema*ta Clerck. Imm.
E. cucurbitina Clerk. ♀.
E. sturmii Hahn. ♀.
E. umbratica Clerck. ♀.
E. quadrata Clerck. 1877.
Xysticus cristatus Clerck. ♀ and imm.

Naturalist,

Philodromus dispar Walck. ♀.
P. cespiticolis Walck. ♂, ♀s.
Pirata piraticus Clerck. ♀s.
Lycosa amentata Clerck. ♂, ♀s.
L. pullata Clerck. ♂.
L. lugubris Walck. ♀.
Salticus cingulatus Panz. ♀.

HARVESTMEN.
Platybunus corniger Herm.
Liobunum rotundum Latr.
Oligolophus morio Fabr.
O. ephippiatus. C. Koch.

MITES.
Gamasus crassipes Linn.
Anystis baccarum Linn.

COLEOPTERA.—Dr. W. J. Fordham writes:—The work accomplished by the three coleopterists present, with the aid of one or two other members, was very satisfactory. The total (excluding a few species still unidentified) reached 148 species, including 13 species new to V.C. 64 and one species new to Yorkshire. The members of the Coleoptera Committee present were Dr. Corbett, Mr. T. Stainforth and the writer.

The most noticeable feature was the abundance of *Telephoridæ*; *lividus* L. and *pellucidus* F. being in swarms, and among the latter were two specimens of *Podabrus alpinus* Pk., exactly similar in colouring and not distinguished from it in the field, or more specimens might have been taken. *Podabrus alpinus* is only previously known from Wheatley Wood and North Yorkshire. One specimen of *Rhagonycha testacea* L. occurred among the commoner *limbata* Th. and *pallida* F. It is a very local insect in Yorkshire. *Malachius bipustulatus* L. was common. Two species of *Scymnus* viz., *nigrinus* Kug. and *capitatus* F. were taken singly, both having previously only one record each (in North Yorks.) An entirely black specimen of *Micropeplus staphylinoides* Marsh occurred in the sweep net, and one example of *Gymnetron beccabungæ* L. (of the var. *nigrum* Hardy), which latter insect is new to Yorkshire. A look out was kept for *Strangalia armata* Hbst. which Mr. Roebuck had found to be abundant on umbellifers on a previous visit, but none was seen. The only *Longicornes* taken were *Clytus arietis* L. (two specimens) and *Grammoptera ruficornis* F. (several, including an extremely small form, and one much above the average size). Mr. B. Morley handed in a specimen of *Attelabus curculionoides* L. of which insect he saw several on young oaks. *Bembidium rufescens* Guer., *Bradycellus placidus* Gyll. and *Trechus secalis* Pk., were taken by Mr. Falconer when searching for Spiders in the marshy field near the wood. A small specimen of *Brachytarsus varius* F. (rare and only previously taken near Doncaster), was picked out of Mr. Porritt's umbrella, probably beaten from pine, where the larva feeds on a *Lecanium*.

Among Mr. Stainforth's captures were four specimens of *Melandrya caraboides* L. from under the bark of an old willow tree. This local and handsome blue black insect has been recorded for Selby by the Rev. C. D. Ash. Mr. Stainforth notes that he captured large numbers of *Anchomenus oblongus* Stm., a local species, which however, often turns up in numbers

in a limited area. A specimen of *Xantholinus ochraceus* Gyll. was taken of a dark form which Mr. W. E. Sharp thinks is a northern race, and which occurs occasionally at Bubwith. *Phyllobius oblongus* L. was very abundant and varied greatly in size and colour.

Other beetles deserving special mention are :—*Hygronoma dimidiata* Gr., very local, nearest localities are Askham Bog and Bubwith. *Gyrophaena gentilis* Er., only previously recorded from N.E. Yorks. *Meligethes rufipes* Gyll., very local and new to V.C. 64. *Psylliodes affinis* Pk., on *Solanum Dulcamara.* Only records, York and Bubwith. *Hypera rumicis* L., a local species taken at Hull, Filey and Ashkam Bog. *Magdalis pruni* L., rare (previous records, York and Rossington).

In the following list of species the dagger (†) indicates that the insect has not previously been recorded from Yorkshire, and the asterisk (*) that the record is new for V.C. 64, M.W. Yorks. Species very common generally have not been included.

Notiophilus palustris Duft.
Bradycellus placidus Gyll.
Pterostichus strenuus Pz.
Anchomenus angusticollis F.
A. oblongus Stm.
A. fuliginosus Pz.
Bembidium rufescens, Guêr.
B. flammulatum Clair.
Patrobus excavatus Pk.
Trechus secalis Pk.
**Brychius elevatus* Pz.
Hyphydrus ovatus L.
**Gyrophaena gentilis* Er.
Hygronoma dimidiata Er.
Tachyporus solutus Er.
T. pusillus Gr.
Ocypus brunnipes F.
Philonthus fimetarius Gr.
Xantholinus ochraceus Gyll.
Stilicus affinis Er.
Stenus bimaculatus Gyll.
S. brunnipes Steph.
S. pallitarsis Steph.
S. picipes Steph.
Lesteva longelytrata Goeze.
Anthobium torquatum Marsh.
Necrophorus vespillo L.
**Scymnus nigrinus* Kng.
**S. capitatus* F.
**Micropeplus staphylinoides* Marsh.
**Meligethes rufipes* Gyll.
**M. lumbaris* Stm.
M. viridescens F.
Byturus tomentosus F.
Agriotes pallidulus Ill.
Dolopius marginatus L.
Corymbites quercus Gyll.
Campylus linearis L.
**Cyphon nitidulus* Th.
**Podabrus alpinus* Pk.
Telephorus pellucidus F.
T. nigricans Mull.
**T. lituratus* Fall.
**Rhagonycha testacea* L.
**R. pallida* F.
Malthodes marginatus Lat.
Malachius bipustulatus L.
Clytus arietis L.
Grammoptera ruficornis F.
Hydrothassa marginella L.
Aphthona nonstriata Goez.
Mantura rustica L.
Psylliodes affinis Pk.
Melandrya caraboides L.
**Brachytarsus varius* F.
Attelabus curculionoides L.
Apion ervi Kirb.
A. violaceum Kirb.
A. humile Germ.
Polydrusus cervinus L.
Phyllobius oblongus L.
Hypera rumicis L.
Erirhinus acridulus L.
†*Gymnetron beccabunga* L. (var. *nigrum* Hardy).
Cœliodes 4 maculatus L.
**Poophagus sisymbrii* F.
Ceuthorhynchus erysimi F.
C. contractus Marsh
Ceuthorhynchideus floralis Pk.
Rhinoncus pericarpius L.
Magdalis pruni L.

Botany.—Mr. W. E. L. Wattam writes :—In all probability Bishop Wood is on the site of the ancient forest of the Ouse and

Derwent. From the evidence still remaining, it was originally a Carr Wood covered by alder, willow, poplar, and birch in the wetter parts, and chiefly by oak in the drier parts. Considerable changes have, of course, taken place by reason of constant felling and replanting, but although covering such a large acreage the wood is devoid of any particular planned zonation of its timber growth. The oak, both of the types *pedunculata* and *sessiliflora*, is common, and there is a good admixture of ash, beech, sycamore, mountain elm, small-leaved elm, birch, alder, goat willow, crack willow, black poplar, white poplar, elder, geulder rose, hazel, spruce, scot's pine, and larch.

The type of vegetation found in the wetter parts of the wood is an association consisting chiefly of *Angelica sylvestris, Cnicus palustris, Spiræa ulmaria, Epilobium angustifolium, Iris pseud-acorus*, a vigorous grass sward of *Aira cæspitosa*, and *Poa trivialis*, and an abundance of the ferns, *Lastrea Filix-fœmina, L. filix-mas*, and *L. spinulosa*. Undoubtedly one of the floral charms of the wetter drives was the abundance of *Lysimachia nemorum*, whose massed wealth of blossom clothed this particular habitat as with a ' cloth of gold.'

In the drier parts of the wood the association was of *Scilla festalis, Allium ursinum, Primula vulgaris, Oxalis Acetosella, Sanicula europæa* and *Holcus*, with zones of *Pteris acquilina*. Where deeper shade occurs prominent plants are *Circæa lutetiana, Mecurialis perennis, Melica uniflora* and *Brachypodium sylvaticum*, along with the ferns previously mentioned.

Near the south side of the wood there is a large portion of ground which, some years ago, was broken up for small holdings. These fell into disuse, and this area was replanted with young trees of ash, elder, alder, birch, sycamore, larch, and species of pine. The ground is extremely moist, and the undergrowth consists of *Epilobium angustifolium, Spiræa Ulmaria, Cnicus palustris, Scrophularia nodosa, S. aquatica, Ajuga reptans, Galium palustre, Digitalis purpurea, Arctium Lappa, Aira cæspitosa, Poa trivialis*, and *Dactylis glomerata*. The chief plants of the dry ridges of the cart tracks are *Potentilla Tormentilla, P. reptans*, and *Stellaria holostea*.

A further pleasing feature of the woodland carpet is undoubtedly the ferns which luxuriate to perfection. *Lastrea Filix-fœmina* and *L. filix-mas* are exceptionally common, and *L. spinulosa* is abundant also. Where practically pure oak occurs *Pteris acquilina* grows vigorously, and is of great height. A single patch of *Polypodium Dryopteris* was noted, but most noteworthy was *Polypodium Phegopteris* in one part of the wood covering about twelve square yards of ground, and in the immediate vicinity were other fair-sized patches of the same fern.

A fine form of bramble was met with, thought to be the variety *Balfourianus*. It was about four and half feet in

height, with many vigorous off-shoots. The foliage was also very large, and the flowers, of good size, were borne on stems about nine inches in length. There is also a patch of the *Conwallaria majalis*, and Mr. Cawthorn subsequently sent me specimens of *Echium vulgare*.

The duckpond in the wood yielded *Myriophyllum spicatum*, *Potamogeton natans* and *Lemna trisulca*. Along its borders flourished *Lycopus europæus*, *Iris pseud-acorus*, *Lysimachia nummularia*, *Scrophularia aquatica*, *Orchis maculata*, *Epipactis palustris* and *Carex remota*.

Before entering the wood the vegetation of a portion of Hambleton Dyke was examined, and here were noted *Ranunculus sceleratus*, *Veronica Anagallis*, *Hippuris vulgaris*, *Ceratophyllum demersum*, and *Glyceria fluitans*.

Mycology.—Mr. A. E. Peck writes:—This section was represented by Messrs. W. N. Cheesman, R. Fowler Jones and myself. Bishop Wood can never be a 'Mycologists' Paradise' so long as it is so 'well kept,' old and decayed trees being practically non-existent. The long spell of dry weather, as expected, operated against great 'finds.'

On an old willow outside the wood *Fomes fomentarius* occurred, and *Polyporus Rostkovii*, new to the district, was found on a stump in the wood.

It was observed with some interest that *Polyporus squamosus* here frequently possesses a central and symmetrical stem, whereas lateral stems are the usual form.

The following is a full list of the species met with. The Mycetozoa list, which is supplied by Mr. Cheesman, includes species gathered by him on a visit made three weeks earlier.

Armillaria mellea (mycelium only).
Collybia platyphylla.
Mycena sanguinolenta.
Russula olivascens.
Lentinus lepideus.
Hypholoma fasciculare.
H. velutinus.
Polyporus squamosus.
P. Rostkovii.
Fomes fomentarius.
Polystictus versicolor.
Poria vaporaria.
Solenia anomola.
Corticium calcium.
C. Sambuci.
Helotium luteolum Currey.
H. aureum Pers.
Melanomma pulvis-pyrius Fckl.
Daldinea concentrica.
Xylaria hypoxylon.
Nectria cinnabarina.

Mycetozoa.

Badhamia utricularis.
Physarum nutans var. *leucophæum*.
Cribraria aurantiaca.
Comatricha nigra.
C. elegans.
Stemonitis flavogenita.
Dictydiaethalium plumbeum.
Trichia persimilis.
T. varia.
T. botrytis.
T. decipiens syn. *fallax*.
Hemitrichia clavata.
Arcyria ferruginea.
A. nutans syn. *flava*.
Lycogala epidendrum.

Geology.—Mr. T. Sheppard reports:—With the guidance of Messrs. J. F. Musham and W. Reeston, the members comprising the geological section took the road to Brayton Barff

and thence to Hambleton. At the Barff, Mr. B. McGray, the Waterworks Manager, kindly showed the members round the waterworks and also exhibited some interesting cores taken from borings on the Barff. One of these was of particular value, as it enabled the formation of the Lady Well or Wishing Well to be determined.

Brayton Barff itself is an 'outlyer' or island of sandstone left behind while the great mass of Trias, which once existed where the Vale of York now is, was being denuded. Judging from the cores, on the top of this island at the close of the Ice Age, or possibly some time after, a lake was formed covering about 2½ acres. The lower part of the section consisted of a very find bed of clay; upon this was a white deposit greatly resembling the chara marl (though more sandy), found in the lacustrine deposits on the Holderness coast, and upon this again was a layer containing decayed vegetation. If this surmise is correct it seems very likely that a small mere once existed at the top of this sandstone island, the clay bed of which still holds the water which supplies the Wishing Well. It is possible, of course, that this may have originated at the time the ice filled the Vale of York, the Barff being between the two ice streams which its presence formed. We hear locally that for many years it has been the practice of the Selby people, mostly young people, to throw some trifle into this well, at the same time wishing whatever was the particular fancy of the person at the time.

Capping Brayton Barff is a large deposit of gravel, very similar indeed to that of Holme-on-Spalding-Moor and Mill Hill, Brough, and other places in the district. Of course the gravel rests between the solid bed of sandstone and the lake bed already referred to. A good section in the gravel was examined, and from this was obtained quite an interesting collection of glacial erratics, namely:—Cheviot porphyrites, Hornblende Rock from the Lake District; Carboniferous Sandstone (common); Millstone Grit; Carboniferous Limestone and chert, both with encrinites (common), white quartz, quartzites, etc. At another gravel pit at Lund Farm, close by, large numbers of pebbles of Magnesian Limestone were also found, as well as most of the kinds already mentioned. There is no doubt that these gravels take us back to the Great Ice Age, when the Vale of York was filled by the glacier coming down from the Lake District and Teesdale. In another sandstone pit the geologists had a pleasant surprise in the form of a large lunch basket replete with all manner of eatables and drinkables, which was most welcome. We believe they were indebted to Mr. Musham for this treat. There was nothing 'erratic' about it, except, perhaps, at the end of the lunch.

NATURALISTS AT HEBDEN BRIDGE.

GREY skies, and half a gale, were the early morning weather conditions for the Union's excursion to Hebden Bridge on Saturday, July 17th. Naturally they were not conducive to a large party assembling at headquarters to set out upon the investigation of Crimsworth Dene, but fortunately the gale had spent itself by eleven o'clock, and from that time the sun held sway, and the rest of the day was glorious. The attendance gradually grew, and ere the excursion ended assumed quite reasonable proportions. The South-West Yorkshire naturalist has reason to be proud of the many wondrous valleys which have been carved out of the gritstone rocks, and beauteous indeed was the walk up Crimsworth Dene from its base to Lumb Falls, which were seen almost to perfection. A peat-coloured stream of water in good force cascaded along a rocky bed, and on each side was a pleasing picture of vegetation that never failed to tire, and a wealth of sweet blossom produced by plants which recalled the lines of Austin :—

> "No rare exotics nor forced are these ;
> They budded in darkness and throve in storm ;
> They drank their colour from rain and breeze,
> And from sun and season they took their form."

No wonder then, that with a district so classic, especially from a botanical standpoint, the memory of such stalwarts as the late Samuel Gibson, John Nowell, and Thomas Needham were recalled, and not least was the pleasure shared by all, of giving welcome once more to one of the Union's past Presidents, and most eminent mycologist, Mr. Charles Crossland, of Halifax.

Grainwater Bridge, which was set as the limit of the area of investigation, was never reached, inasmuch as the students present found quite sufficient to interest in Midgehole Wood, and along the valley as far as the Falls.

By permission of the Governors, and the Principal, Mr. M. E. Wager, B.Sc., tea was taken at the Secondary School, where the subsequent meeting was also held. The attendance at this meeting was excellent, and under the chairmanship of another of the Union's past Presidents, Dr. Harold Wager, quite an instructive time was spent. Sectional reports upon the work of the day were given as follows :—Geology, Messrs. J. Henry Greenwood and Abraham Newell ; Vertebrate Zoology, Mr. Walter Greaves ; Flowering Plants, Mr. F. W. Whitaker ; Dr. Woodhead supplementing with remarks upon the chief ecological features of the Crimsworth Valley ; Ferns, Mr. Fenton Greenwood ; Mosses, Mr. W. H. Burrell ; Fungi, Dr. Harold Wager, F.R.S. ; Conchology, Mr. Greevz Fysher ; Hymenoptera, Mr. Rosse Butterfield. A comprehensive vote of thanks to the landowners for permission to visit their

respective estates, to the guides, Messrs. W. Greaves, S. C. Moore, S. Fielding, A. Newell, and J. H. Greenwood, to the Governors and Principal of the Secondary School, to the Hebden Bridge Literary and Scientific Society, and to Mr. Edward B. Gibson for making the local arrangements, was unanimously adopted on the motion of Dr. Woodhead, seconded by Mr. W. H. Burrell.

The collections of the late Mr. James Needham were placed on exhibition by the local society.—W. E. L. W.

The following sectional reports are to hand :—

Vertebrate Zoology.—Mr. Walter Greaves, writes :—The necessary impetus for a strict investigation was lacking, because to all the vertebrate zoologists taking part the fauna was intimately known. Only a small number of birds, and one mammal were noticed. In Middle Dene wood a too precocious Sparrow Hawk, with down still on its head, was caught, and the other most noteworthy find was a Redpoll's nest, still with eggs, in a bush not more than four feet off the ground. The less common of other birds seen or heard were Redstart, Spotted Flycatcher, Grey Wagtail, Dipper and Sandpiper.

Conchology.—The Conchological Section was represented by Mr. Greevz Fysher, who found in Peckett Wood *Arion ater* type, adult, and vars. *nigrescens* and *luteopallescens* juv. ; *A. subfuscus* var. *rufofusca, Agriolimax agrestis* var. *reticulata, Hyalinia alliaria, Pyramidula rotundata, Helix hortensis* var. *lutea* 12345, *Cochlicopa lubrica, Limnæa peregra, L. truncatula,* and an undetermined *Pisidium.*

Bryology.—Mr. W. H. Burrell, F.L.S., reports :—The moss flora is typical of a gritstone clough. *Tetraphis pellucida, Ceratodon purpureus, Dicranella heteromalla, Campylopus flexuosus, Webera nutans, Mnium hornum, Plagiothecium elegans,* are the conspicuous species on peat and rock of the drier slopes ; wet rocks in the rivulets are clothed with *Mnium punctatum, Eurhynchium rusciforme, Conocephalum conicum, Pellia epiphylla, Chiloscyphus polyanthus* and *Scapania undulata* ; swampy areas near the river have a marsh flora indicated by *Sphagnum* sp., *Fissidens adiantoides, Hypnum cuspidatum, Hypnum stramineum,* etc. Recent heavy rains had left the rupestral mosses in beautiful condition ; special note was made of great sheets of *Barbula cylindrica* lining the roadside walls, showing colour and texture to perfection.

Some interesting Dicranoids were gathered in Midgehole Wood. Opinion differed as to whether they were forms of *Campylopus flexuosus* or of a *Dicranum.* A study of the leaf sections showed that all had the nerve characters of *Campylopus.* Some tufts were almost devoid of tomentum, and consisted largely of the well-known deciduous flagelliform

branches, with short obtuse leaves. *Ditrichum homomallum* was gathered by Mr. H. E. Johnson, and Mr. J. C. Wilson directed attention to *Catharinea crispa* and *Tetraphis Browniana,* the former in great profusion, with male inflorescence. Altogether forty-nine species of mosses and liverworts were noted.

Flowering Plants and Ferns.—Miss C. E. Andrews writes :—The botanical section was well represented. The rainfall had refreshed all vegetation, and the floral charms of the valley were seen practically to their full perfection. Undoubtedly the most interesting plant was *Pyrola media.* The noteworthy plants of the swamp areas were *Lychnis flos-cuculi, Valeriana officinalis, Myosotis palustris, Œnanthe crocata, Cardamine amara, Glyceria fluitans, Carex ovalis, C. sylvatica, C. binervis,* and *Equisetum palustre.* The cut-leaved form *angustifolium* of *Heracleum sphondylium,* often met with in gritstone valleys, was also noted, as was also *Hypericum pulchrum.* Unfortunately the herbage of the field where rare species of orchids were known to occur had been cut down, and the only species seen were *Habenaria virescens* Druce, and *O. maculata.* On the steep crags near the Falls the countless blossoms of *Crepis paludosa* and *Lactuca muralis* made a pretty picture. Amongst the trees was *Prunus Padus* in fruit. The uncultivated upland pastures yielded a characteristic heath association of plants, *Erica tetralix* being not uncommon. The wealth of ferns is one of the charms of the valley. Many species were seen, amongst them being fine examples of *Lastrea oreopteris, L. dilatata, L. spinulosa, L. filix-mas,* with its scaly rachis form *paleacea,* and *Athyrium Filix-fœmina.* Mr. Burrell found a frond of the latter fern which had developed two distinct branches. *Polypodium vulgare* and *Ophioglossum vulgatum* were also listed.

Geology.—Mr. J. Henry Greenwood reports :—The geologists took the opportunity of examining the lower beds of Kinderscout grits and the upper beds of the Yoredales or Pendlesides. These beds form the most prominent physical feature of the district from the bottom of the Calder Valley, 320 feet, to the 800 feet line. Above these the alternating bands of grits and shales of the middle grit series, with a thin seam of coal and ganister, at 1,000 feet, cap the hills to the east and south-east. A good section of the Kinder grits was seen in Nutclough. They were found to be a very coarse grained sandstone containing a large quantity of quartz pebbles, and also a number of fairly large nodules. Throughout the district on this particular horizon these nodular concretions are very abundant. They were also examined at the quarries in Pecket Wood.

In Crimsworth Dene the effect of grit rocks resting on shale beds in a narrow valley was noticed. Huge blocks of

sandstone are strewn along the sides of the valley, while others have rolled down into the river bed.

From the foot of the Dene to Lumb Falls, the Yoredales or Pendlesides were found to be exposed along the stream sides with the exception of a short distance where the Wet Ing fault, with a downthrow of about 35 yards, bring the Kinder grits into the bottom.

The hard nodular bands of limestone which occur on the left hand side of the stream just above the fault were worked for a little while, and a few fossils, *Aviculapectens* and *Goniatites* were obtained.

At Lumb Falls the formation of water-falls was well illustrated. The shales are overlaid by the hard band of Kinder grits over which the stream flows, and as the continued swirling of the water wears out the softer material, the harder step which forms the fall is constantly breaking off and gradually receding. Several flat places on the hillsides were pointed out as old river terraces.

Mr. Abraham Newell records the presence of a number of pot-holes in Nutclough, both in the bed of the stream, and on inclined and vertical sides of the rocks. The generally accepted theory imputes them to the grinding action of sand and pebbles set in swirling motion by wind or water. Personally, I consider that the alleged motion seldom takes place, and if it does the grinding effect is very feeble. Obviously this action cannot take place on upright faces of rocks. The potholes noticed during the excursion are coincident in horizon with beds in which nodular concretions are abundant wherever quarries are opened. These statements hold good throughout the Kinder grit and Haslingden Flag districts, where are thousands of pot-holes, whether in a clough or the open country. The nodules, being composed of more easily eroded material than the surrounding rock, have been disintegrated and removed, leaving cavities behind. Thus every pothole represents a once existing nodule.

Lepidoptera.—Mr. E. B. Gibson writes :—Lepidoptera were very scarce, and none but common species were obtained. *Tortrix viridana* was abundant and in fine condition. *Metrocampa margaritaria, Cidaria populata, Tortrix ministrana* and *T. fosterana* were the only other species observed.

Hymenoptera.—Mr. Rosse Butterfield reports :—Dr. A. Wilman and I explored Crimsworth Dene for Hymenoptera and Diptera. Commencing at Lumb Bridge we worked down the valley to the bottom. The lower part of the Dene seems favourable for the Fossorial Hymenoptera, but on the day of the Union's excursion the sun did not gain sufficient power to induce these active creatures to fly. On both sides of the valley several large nests of the ant, *Formica rufa,* were found, and a careful though fruitless search was made for *Formi-*

coxcnus nitidulus, which associates with this ant, and which was found some years ago by the Rev. F. D. Morice in an adjoining valley. Apparently the woods and heaths of Hardcastle Crag and Crimsworth Dene are the only remaining localities for *Formica rufa* in the hilly portion of West Yorkshire. There is no doubt that it has disappeared from other localities within recent years, and in others again there is nothing but place names to indicate its former occurrence, i.e., Pismire Clough. Other species of ants noted, chiefly under stones, were *Myrmica rubra* and *Lasius niger.*

The following social bees were found frequenting heads of marsh thistle and the flowers of meadow sweet :—*Bombus agrorum, B. pratorum* (very common), *B. latreillellus* (queen only), *B. terrestris* (common), *B. terrestris* var. *virginalis, B. lapidarius, B. lapponicus* (worker only), *Psithyrus vestalis.*

The social wasps seen were :— *Vespa vulgaris, V. rufa, V. norvegica, V. sylvestris.*

Of the solitary bees the common species *Halictus rubicundus* and *Andrena albicans* only were captured.

Diptera.—Mr. Butterfield writes :—Among the larger Diptera, the undermentioned were determined :—*Syrphus ribesii, S. grossularia, Volucella pellucida, Sericomyia borealis, Eristalis pertinax.*

Mr. W. H. Burrell reports that a large proportion of the Birch seed that was seen was infested with the grub of *Oligotrophus betulæ.* He is indebted for the identification of this species to Mr. G. H. Taylor of Leeds University.

Arachnida.—Mr. Falconer writes :—The following arachnida were obtained as the result of three day visits paid at different times to the Hardcastle Crags valley, and one with Mr. Winter as my fellow worker to Crimsworth Dene, July 31st. The entries include 88 species of spiders, 7 harvestmen, one false scorpion and 10 mites. The rarer British species on the list are *Hahnia pusilla* C. L. Koch (Delamere Forest and Ripon), *Onesinda minutissima* Camb., *Centromerus arcanus* Camb., *Macrargus firmus* Camb., *Sintula cornigera* Bl., and *Maro* sp.ined. (the last also at Slaithwaite, but male not yet to hand). Of a few others the distributional range in the county still needs elucidating, *Leptyphantes mengii* Kulcz., *Porrhomma montanum* and *P. pallidum* Jacks, *P. thorellii* Herm., *Enidia bituberculata* Wid. (records for W. Riding unaccountably few), *Wideria cucullata* C. L. Koch, etc. The *Hahnia, Sintula,* and *W. cucullata* were taken in Shackleton Wood, *Centromerus arcanus, C. prudens, Macrargus firmus, Maro,* at Hardcastle Crags, and *Onesinda* shaken from heather roots overhanging a wall at the Fishpond, Crimsworth Dene.

In the list the species which occurred in both valleys are unmarked ; those only in the Hardcastle Crags Valley are

distinguished by an asterisk, and those only in Crimsworth Dene by a dagger. In the case of the spiders, unless otherwise stated, both sexes were obtained.

SPIDERS.

Oonops pulcher Templ., ♀s.
Micaria pulicaria Sund.
Clubiona terrestris Westr., ♂.
C. reclusa Camb.
C. trivialis L. Koch.
C. comta C. L. Koch.
Amaurobius similis Bl., ♀s.
A. fenestralis Stroem., ♀s.
Coelotes atropos Walck., ♀s.
Tegenaria derhamii Scop.
Hahnia pusilla C. L. Koch., ♀.
Pholcomma gibbum Westr.
Onesinda minutissima Camb., ♀s.
Phyllonethis lineata Clerck., ♀s.
Robertus lividus Bl.
Bolyphantes alticeps Sund.
B. luteolus Bl.
Drapetisca socialis Sund.
Stemonyphantes lineata Linn.
Linyphia triangularis Clerck.
L. peltata Wid.
L. clathrata Sund., ♀s.
Labulla thoracica Wid.
Leptyphantes terricola C. L. Koch.
L. blackwallii Kulcz.
L. obscurus Bl., ♀s.
L. pallidus Camb.
L. tenuis Bl., ♂s.
L. ericaeus Bl.
†*L. mengii* Kulcz., ♂s.
Poeciloneta globosa Wid.
Bathyphantes concolor Wid.
B. approximatus Camb.
†*B. parvulus* Westr.
B. gracilis, Bl.
†*Porrhomma montanum* Jacks., ♀.
P. pallidum Jacks., ♀.
P. thorellii Herm., ♀s.
Hilaira excisa Camb.
Macrargus rufus Wid.
M. firmus Camb., ♀.
Oreonetides abnormis Bl.
Centromerus arcanus Camb.
C. prudens Camb., ♂.
Centromeria bicolor Bl., ♀s.
C. concinnus Thor., ♀s.
Agyneta conigera Camb.
Micryphantes viaria Bl.
†*M. saxatilis*, Bl., ♂s.
Sintula cornigera Bl., ♀s.
Rhabdoria diluta Camb.
Maro sp.ined. ♀.
Maso sundevallii Westr.
Œdothorax agrestis Bl.,
O. retusus Westr.
†*Tiso vagans* Bl., ♀s.
Erigone dentipalpis Wid., ♂.
E. atra Bl., ♀s.
Dicymbium tibiale Bl.
Neriene rubens Bl.
N. rubella Bl.
Enidia bituberculata Wid., ♀.
Dismodicus bifrons Bl.
Diplocephalus cristatus Bl., ♀s.
D. fuscipes Bl.
D. latifrons Camb., ♀s.
†*Entelecara erythropus* Westr.
Pocadicnemis pumila Bl.
†*Cnephalocotes obscurus* Bl., ♂s.
Tapinocyba pallens Camb.
Wideria cucullata C. L. Koch.
Walckenæra acuminata Bl.
W. nudipalpis Westr., ♀s.
Cornicularia cuspidata Bl.
Ceratinella brevipes Westr., ♀s.
Pachygnatha degeerii Sund.
Nesticus cellulanus Clerck.
Meta segmentata Clerck.
M. merianæ Scop.
Zilla x-notata Clerck.
Epeira diadema Clerck.
Xysticus cristatus Clerck., Imm.
†*Pirata piraticus* Clerck.
†*Trochosa terricola* Thor.
Tarentula pulverulenta Clerck.
Lycosa amentata Clerck.
L. pullata Clerck.
Neon reticulatus Bl.

HARVESTMEN.

Liobunum rotundum Latr.
Platybunus corniger Herm.
Oligolophus morio Fabr.
and Forma *alpinus* Herbst.
O. ephippiatus C. L. Koch.
O. agrestis Meade.
Nemastoma lugubre O. F. Müll.

FALSE-SCORPION.

Obisium muscorum Leach.

MITES.

Anystis baccarum Linn.
Erythraeus nemorum Koch.
Linopodes motatorius Linn.
Cyrtolaelaps nemorensis Koch.
Gamasus crassipes Linn.
G. coarctatus Koch.
†*Oribates globulus* Nic.
O. edwardsii Nic.
Oppia bipilis Herm.
Damaeus clavipes Herm.

In Memoriam.

Second-Lieutenant GEORGE MITCHELL.

Unfortunately this great and terrible war is already taking toll of the membership of the Yorkshire Naturalists' Union, as it is more seriously of the best and the most physically fit of the youth of the nation—and of Europe. In George Mitchell our country has lost one of its finest examples of youthful manhood, and one who could with nature's weapons, have 'laid out' any German ever born. Although only twenty-six years of age, he was a veritable giant in physique, and a thorough sportsman in every sense of the word. He was about the finest amateur heavy-weight boxer in the country, and his wrestling was very little behind his boxing, and in the West Riding was only about second to his brother Tim. Although such a perfect exponent of the 'noble art of self defence' he was one of the most gentle and considerate of companions. His bout with Georges Carpentier—the French boxing champion of Europe, although it brought Mitchell into notoriety, showed him up in an unfair light. Through the services of a mutual friend, he paid for a private trial with the champion under the impression that he would be able to stand up against him longer than Bombardier Wells had done, which he succeeded in doing, but only by a few seconds. Unfortunately the press got scent of the match, and in a slack time of news they made the most of it.

For the past three years George Mitchell had attended the meetings of the Vertebrate Zoology section of the Yorkshire Naturalists' Union, where he had taught us much of value and of interest concerning the details of falcons and falconry, and eighteen months ago he became a life member of the

Union. In spite of his years he was already an authority on the very ancient (and once noble) sport of falconry, and in every detail appertaining to his favourite birds and hobby. From his earliest 'teens' Young Mitchell dearly-loved a hawk or a falcon, and was rarely without one or more, which he delighted to train and to control. Later he became a member of the Old Hawk Club, and at his father's house, The Upwood, near Bingley, he usually had trained Peregrine Falcons, Merlins, Goshawks, etc., besides a trained falconer in velveteens from the Old Hawk Club. At times, and for many years past a Falcon, Goshawk, or Buzzard would escape from his falcon-house, and for some time would be a target for all the local gunners, and would also have supplied an additional local 'record' had we not known of its history. At such times he was called upon to pay accounts for numerous pigeons, chickens, etc., by local farmers and others. He more than once assured the writer that none of his captive birds had a tithe of the appetite that his escaped birds had !

Shortly after the outbreak of war, George Mitchell, together with his only brother, joined the Public Schools Officers' Training Corps at Ashted, Surrey, and later obtained a commission in the celebrated Black Watch Regiment. He specialized in bomb-throwing, and thereby met his death at the front on July 22nd. He was instructing a detachment of the Grenadier Guards in the art of bomb-throwing, when the bomb exploded in the trench-mortar and literally blew him to pieces.

George Mitchell's death is a great loss to the Yorkshire Naturalists' Union, and more especially to falconry, for how many young fellows now take up this sport whole-heartedly ? He was also a fairly good all-round ornithologist and a protector of wild birds in moderation. In this respect I should not do him justice if I omitted to say that just before the war broke out he was in league with our Wild Birds' and Eggs' Protection Acts Committee to try and trap some persistent robbers of Peregrine Falcons' eyries.

Death has been unkind to his family lately. The last time that I saw George Mitchell was at his father's funeral, about two months before his own unexpected decease. Shortly before that his uncle, Mr. Percy Illingworth, the late Chief Liberal Whip died suddenly. Before the war young Mitchell, was in his father's business—Messrs. Mitchell Bros., Ltd., Bradford, Mohair Spinners and Manufacturers. The photograph (in the uniform of the Black Watch Regiment) was taken a few weeks before his death.

It is a pathetic incident that the last note on the last page of *The Naturalist* for August was written by Geo. Mitchell, at the front in Flanders: the September number contains his obituary notice !—H. B. B.

1915 Sept. 1.

FIELD NOTES.

COLEOPTERA.

***Sermyla halensis* var. *cuprina* Weise at Carlisle.**—The type of this beetle is plentiful in some parts of this district. It chiefly occurs on Bedstraw in autumn. Near the village of Belle Vue I obtained one specimen of the var. *cuprina* of Weise, and many of the usual form. Mr. Newbery, who has seen my specimen, says this variety is rare in Britain.—Jas. Murray, Carlisle.

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ARACHNIDA.

Arachnida at Settle.—Partly because of the long period of dry weather, collecting at Settle during Whit week-end did not yield a very comprehensive 'bag.' Although small insects were numerous on butterwort leaves, no spider was observed making any attempt to benefit therefrom.

The following list includes the spiders, etc., collected during the course of the excursion of the Yorkshire Naturalists' Union, as well as others handed in by members of the party. There are also included some which were taken by Mr. Falconer on July 2nd, 1910, a very wet day.

(*a*) Giggleswick Scars } 1910, July 2,
(*b*) Stainforth Force } Mr. Falconer.
(*c*) Horton in Ribblesdale to Settle, mostly by the Ribble, 1915.
(*d*) Giggleswick Scars and to Oxenber, 1915.
(*e*) Cocket Moss, 1915.

Harpactes hombergii Scop., ♀, ♂, *a*.
Oonops pulcher Templ., ♀ Imm., *d*.
Drassus lapidosus Walck., ♀ Imm., *c*.
Clubiona comta C.L.K., ♀, *d*.
C. diversa Cb., ♀, *d*.
Dictyna uncinata Westr., ♀ Imm., *e*.
Amaurobius fenestralis Stroem, ♀, *a*, ♂, nearly adult, *d*.
Cryphoeca silvicola C.L.K., ♀, *b*.
Coelotes atropos Walck., ♀, *a*, *d*.
Hahnia helveola Sim., ♀, *a*.
Leptyphantes minutus Bl., ♀, *b*.
L. blackwallii Kulcz., ♀, *d*.
Bathyphantes nigrinus Westr., ♀, *b*.
B. dorsalis Wid., ♂, *c*.
Phaulothrix huthwaitii Cb., ♀, *c*.
Dismodicus bifrons Bl., ♀, *d*.
Diplocephalus cristatus Bl., ♂, *b*.
Walckenaera acuminata Bl., ♂, *a*.
Ero furcata Wid., ♀, *a*.
Meta segmentata Clerck), ♂, *d*.
M. merianae Scop., ♀, Imm., *d*.
Xysticus cristatus Clerck., ♀, *d*., ♂, *c*, *d*.
Pirata piraticus Clerck., ♀, ♂, *e*.
Trochosa terricola Thor., Imm. ♀, *d*.
Tarentula pulverulenta Clerck., ♀, *d*., ♂, *c*, *d*.
Lycosa amentata Clerck., ♀, *e*.
L. pullata Clerck., ♀, *d*, *e*, ; ♂, *d*.
L. palustris Linn., ♀, *d*, *e*., ♂, *c*, *d*.

Harvestmen.

Liobunum rotundum Latr., *b*.
Oligolophus morio Fabr., *d*.
O. alpinus Herbst., *a*, *b*.
O. agrestis Meade, Imm., *a*.
Nemastoma lugrube, O.F.M., *d*.

W. P. Winter.

Naturalist

BIRDS.

Early Reference to the Plover in Yorkshire.—I have recently obtained a small 4to volume entitled 'Newes out of York-shire: or An Accovnt of a Iovrney, in the trve Discovery of a soueraigne Minerall, Medicinall Water, in the West-Riding of *York-shire*, neere an ancient Towne called *Knaresborough*, not inferiour to the *Spa* in *Germany*. Also a taste of other Minerall Waters of seuerall natures adioyning, by M.S.' [Michael Stanhope]. This work was written 'this summer 1626.' On page 3 we learn 'It is (as I am credibly enformed) about 50 yeres since first notice was taken of a Spring (in the West-riding of Yorke-shire, neere a Towne called *Knaresborough*) called at this day by the countrey people, *Tuit-well*, it seemes for no other cause, but that those birdes (being our greene Plouer) doe vsually haunt the place.' On page 4: 'This *Tuit-well* (I feare the poorenesse of the name, hath not a little disaduantag'd it) hath beene most grosly neglected, as if it were a place onlye worth the notice of that silly bird.'*—T. SHEPPARD.

A new West Riding Heronry.—A new heronry is being formed in extreme upper Wharfedale, where no heronry is known to have ever existed anywhere near. The birds were first noticed to frequent Kirkgill Wood, near Hubberholme, in the year 1913. In 1914 there were two nests, and this year three pairs have safely nested. Fortunately it is situated on the estate of Miss Crompton Stansfield, of Buckden, to whom I am indebted for several interesting details, and this lady has given strict instructions to her gamekeeper not to allow the birds to be interfered with, or annoyed in any way. The Heron and its eggs are protected all the year round in the West Riding, and the Wild Birds' and Eggs' Protection Acts Committee of the Yorkshire Naturalists' Union is prepared to take proceedings against offenders. I feel quite sure that this new heronry is an off-shoot from the old-established one at Eshton, in Airedale. On the Eshton estate tree-felling has been going on for several years. Herons, like Rooks, do not like trees being cut down in the vicinity of their nests, even though scrupulous care be taken not to fell a tree that contains a nest.—H. B. BOOTH.

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MOSSES.

***Tortula cernua* Lindb., near Leeds.**—At the June meeting of the Leeds Naturalists' Club, a discussion centred on a luxuriant growth of *Leptobryum pyriforme* Wils., and its habitat—a lime debris—which had attracted attention during a ramble to Aberford on the previous Saturday. Mr. Chris. Cheetham suggested the likelihood of such a station harbouring

* This referred to the Tewit well which is still much used at Harrogate.

Tortula cernua, seeing that it was in the immediate district that Mr. Webster first found the plant in 1900, and that in its only other recorded station at Conisborough, in 1909, it was growing on lime debris in association with *Leptobryum.* The suggestion was promptly utilised and many old discoloured capsules of the *Tortula* were found, which had been previously overlooked, owing to the plants being buried in a dense growth of *Funaria hygrometrica,* the oblique gibbous capsules of the two species having some superficial resemblance. A beautiful display of this rare moss has since developed, several square yards of ground being toned with the red setæ of the young sporophytes. The lime on which it grows is sedimented from water pumped from a neighbouring coal mine, after use in steam condensers. When tested at the outfall to a cooling pit, this condenser waste had a temperature of 130°F. The overflow runs away as a small open stream to the Cock beck. Alkaline earths in solution are precipitated when carbonic anhydride is dissipated by heat, the troughing, cooling pit and stream bed being thickly coated with the white deposit, which is from time to time cleared out and dumped on some adjoining rough pasture. The *Tortula* and *Leptobryum* are restricted to damp places near the stream and some depressions where water is held up by the underlying clay. Another station has been found about two miles distant, at the base of a wall on the Permian Limestone. Here too, it is associated with *Funaria* and *Leptobryum,* the permanently humid conditions being evidenced by a plentiful growth of *Marchantia polymorpha* L.—W. H. Burrell.

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Elements of Forestry. By **F. F. Moon, B.A.,** and **N. C. Brown, B.A.** London: Chapman and Hall, pp. xvii. + 392, 8s. 6d. net. As the authors point out, American forestry is of comparatively recent development. The first forest reserves were set aside by President Harrison about 20 years ago, but the chief credit for its development is due to President Roosevelt, who, during his term of office, raised the acreage from 46 millions to 194½ millions, and during this time forestry administration was greatly perfected. Naturally the Americans are still far behind some European states where State forests, e.g., in Switzerland, have been developed from very early times. Nevertheless, American forestry has advanced with great rapidity, and this work has been written for students in schools of agiculture and forestry to meet this 'educational awakening.' The authors deal clearly and simply with practically every phase of forestry, and though certain aspects are only briefly treated, students will find it a compact and convenient summary of the leading principles. Part 1 deals with forestry in America and abroad; the tree, its functions and requirements, silvics and silviculture, improvement, regeneration, protection, mensuration, lumbering, utilization, wood technology and preservation, economics and finance. Part 2 deals with studies of the forest regions, and is illustrated by a map showing the natural forest regions of North America. There is an Appendix of rules and tables, and a glossary and short index, the latter being largely a classified list of the subjects mentioned in the full table of contents. The work is illustrated by 65 well selected photographs.

BIBLIOGRAPHY:

Papers and Records relating to the Geology and Palæontology of the North of England (Yorkshire excepted), published during 1914.

T. SHEPPARD, M.Sc., F.G.S.

(*Continued from page 275*).

PERCY F. KENDALL. Derbyshire, Lancs., Notts., Yorks.

On 'Cleat' in Coal Seams. *Geol. Mag.*, February, pp. 49-53. See also *The Naturalist*, April, p. 107.

KRUSCH, P. See F. BEYSCHLAG.

G. W. LAMPLUGH and B. SMITH. Notts.

The Water Supply of Nottinghamshire from Underground Sources [with a chapter on the rainfall by H. R. Mill]. 'Memoirs of the Geological Survey,' pp. 1-174. See also *The Naturalist*, p. 236 and *Geol. Mag.*, October, pp. 475-476.

G. W. LAMPLUGH. Cheshire.

Physiographical Notes. II., on the Taming of Streams. 'Geog. Journ.', June, pp. 651-656.

G. W. LAMPLUGH. See W. GIBSON.

JAMES LOMAX. S. Lancs.

The Microscopical Examination of Coal. 'Trans. Manch. Geol. and Min. Soc.,' Vol. XXXIII., Part 12, pp. 457-464.

JAMES LOMAX. S. Lancs., Yorks.

Further Researches in the Microscopical Examination of Coal, especially in Relation to Spontaneous Combustion [with reproductions of 60 photomicrographs of sections of coal from Yorkshire, Lancashire, etc.] 'Trans. Manch. Geol. and Min. Soc.,' Vol. XXXIII., Part 10, pp. 355-398.

SIR CHARLES P. LUCAS. Lincs., Cumberland.

Man as a Geographical Agency: Address to Section E. (Geography), British Association, Australian Meeting. *Nature*, September 10th, pp. 40-48.

CHARLES LYELL [the late]. N. Counties.

The Geological Evidence of the Antiquity of Man, with Introduction by R. H. Rastall. London, pp. xx.+407.

F. T. MAIDWELL. Cheshire, S. Lancs.

Notes on Footprints from the Keuper. II. 'Proc. Liverp. Geol. Soc.,' Vol. XII., Part 1, pp. 53-71.

F. T. MAIDWELL. Cheshire.

Some Sections in the Lower Keuper of Runcorn Hill, Cheshire. 'Proc. Liverp. Geol. Soc.,' Vol. XII., Part 1, pp. 40-52.

C. A. MATLEY. Notts., etc.

Note on the Source of the Peebles of the Bunter Pebble-Beds of the English Midlands. *Geol. Mag.*, May, pp. 211-5.

H. R. MILL. See G. W. LAMPLUGH.

L. Moysey. Derby, Lancs., Notts., Yorks.
Some further Notes on Palæoxyris and other Allied Fossils, with Special Reference to some New Features found in Vetacapsula. 'Rep. Brit. Assoc.' (Birmingham), 1913, pp. 492-3.

L. Moysey. See W. Gibson.

James Park. N. Counties.
A Text-Book of Geology [many references to northern counties]. London pp. xv.+598.

Henry Preston. Notts.
Clay-Balls and Striated Pebbles, from Bunter Sandstone, Notts. *The Naturalist*, March, pp. 79-83.

H. Preston. Lincs.
Report on Geology. 'Lincs. Nat. Union Trans. for 1913,' published 1914, pp. 108-9.

Willingham Franklin Rawnsley. Lincs.
Highways and Byways in Lincolnshire [brief geological notes]. London, pp. 519.

F. R. Cowper Reed. Lake District.
Notes on the genus *Trinucleus*, Part III. *Geol. Mag.*, August, pp. 349-359.

C. E. Robson. Northumberland and Durham.
Report of the Field Meetings of the Natural History Society for 1909 [includes geological notes]. 'Trans. Nat. Hist. Soc. of Northumberland, Durham and Newcastle-upon-Tyne.' (New Series), Vol. IV., Part I. pp. 177-199.

H. G. Sargent. Derbyshire.
Rock-Soil and Plant Distribution [criticism of Mr. Horwood's paper]. *Geol. Mag.*, March, p. 139.

D. H. Scott. Lancs.
On *Medullosa pusilla* [from Colne, Lancs.] 'Proc. Roy. Soc.,' B., Vol. XCVII., pp. 221-8.

A. C. Seward. Lancs., Yorks.
Climate as Tested by Fossil Plants. 'Quart. Journ. Royal Meteorol. Soc.,' Vol. XL., No. 171, July, pp. 203-212. Reprinted in *Nature*, October 29th, pp. 242-246. See also *Knowledge*, May, p. 190.

Mrs. Shakespear. See Ethel M. R. Wood.

Hilda D. Sharp. See Horace B. Woodward.

T. Sheppard. Lincs.
Geology [of Barton-on-Humber]. Circular 231 in 'Trans. Yorks. Nat. Union,' part 35.

T. Sheppard. Cheshire.
Early Mining Implements [from the old Copper Mines, Alderley Edge]. *Lancashire Naturalist*, March, pp. 447-449 (plates).

T. S[heppard]. Yorks., Lincs.
In Memoriam, Alfred John Jukes-Browne, F.R.S., F.G.S. 1851-1914 [brief references to his work in Yorks. and Lincs.] *The Naturalist*, October, p. 325.

T. Sheppard. N. Counties.
Bibliography: Papers and Records relating to the Geology and Palæontology of the North of England (Yorkshire excepted), published during 1913. *The Naturalist*, May, pp. 161-166, ; June, pp. 193-199.

R. L. Sherlock. See W. Gibson.

Hervey Woodburn Shimer. N. Counties.
An Introduction to the Study of Fossils, Plants and Animals. 450 pp.

B. Smith. See G. W. Lamplugh.

H. G. Smith. Northern Counties.
Minerals and the Microscope, an Introduction to the Study of Petrology, 116 pages.

J. A. Smythe. Northumberland.
On Some Inclusions in the Great Whin Sill of Northumberland. *Geol. Mag.*, June, pp. 244-255.

J. A. Smythe. Northumberland and Lake Dist.
The Glacial Geology of Northumberland. 'Trans. Nat. Hist. Soc. of Northumberland, Durham and Newcastle-upon-Tyne.' (New Series), Vol. IV., Part 1, pp. 86-116.

E. Stanford. See Horace B. Woodward.

A. Strahan. Cheshire.
Summary of Progress of the Geological Survey of Great Britain and the Museum of Practical Geology for 1913, pp. 107.

H. H. Swinnerton. Notts.
Periods of Dreikanter Formation in South Notts. *Geol. Mag.*, May, pages 208-11.

H. H. Swinnerton. See J. W. Carr.

W. M. Tattersall and T. A. Coward. Cheshire.
Faunal Survey of Rostherne Mere, I. Introduction and Methods. 'Mem. and Proc. Manch. Lit. and Phil. Soc.,' Vol. LVIII., Part 2, No. 8, pp. 1-21.

John W. Taylor. N. Counties.
Dominancy in Nature and its Correlation with Evolution, Phylogeny, and Geographical Distribution [reprint]. 'Trans. Yorks. Nat. Union,' Part 35, pp. 1-40.

J. W. Taylor. Lincs., Derbyshire, Lancs., Westmorland, Yorks.
Monograph of the Land and Freshwater Mollusca of the British Isles, Part 20 [includes particulars of the occurrence of fossil and sub-fossil forms of *Helicogona arbustorum* in the counties mentioned]. March 14th, pp. 417-80, Plates xxvi., xxxv., and xxxvi.

Ivor Thomas. Northern Counties.
British Carboniferous Producti, I., Genera Pustula and Overtonia [figures and describes *Pustula elegans* (M'Coy); *P. venusta*, gen. et sp. nov.; *P. sub-elegans*, gen. et sp. nov.; *P. punctata* (Mart.); *P. ovalis* (Phill.); *P. pyxidiformis* (de Koninck), etc.]. 'Memoirs of the Geol. Survey, Palæontology,' Vol. I., Part 4, pages 197-366, Plates xvii.-xx.

Charles B. Travis. Northern Counties.
President's Address [Some evidences of Peneplanation in the British Isles]. 'Proc. Liverpool Geol. Soc.,' Vol. XII., Part 1, pp. 1-31.

W. G. Travis. Lancs. S.

The Plant Associations of Some Lancashire Peat-Mosses. *The Lancashire and Cheshire Naturalist*, August, pp. 171-176.

C. T. Trechmann. Durham and Yorks.

On the Lithology and Composition of Durham Magnesian Limestones [brief references to Yorkshire]. 'Quart Journ. Geol. Soc.,' Vol. LXX., Part 2, No. 278, pp. 232-265. Abstract in *Nature*, February 26th, p. 729.

C. T. Trechmann. Northumberland and Durham.

Notes on Neolithic Chipping-Sites in Northumberland and Durham. 'Trans. Nat. Hist. Soc. of Northumberland, Durham and Newcastle-upon-Tyne' (New Series), Vol. IV., Part 1, pp. 67-85.

C. T. Trechmann. Durham.

The Superficial Deposits of South-East Durham and the Lower Tees Valley. Abstract *Geological Magazine*, July, pp. 331-2. See also *The Naturalist*, July, pp. 203-5.

S. J. Truscott. See F. Beyschlag.

Charles Turner. Lake District, Yorkshire.

The Microscopy of the Manchester Water Supply. 'Ann. Rep. and Trans. Manchester Microscopical Society,' 1913, pp. 44-58.

J. H. L. Vogt. See F. Beyschlag.

W. T. Walker. Lancs. S., Cheshire.

Some Observations on the Liassic Outcrop near Whitchurch (Shropshire) [refers to the Cheshire and South Lancs. Area]. 'Proc. Liverpool Geol. Soc.,' Vol. XII., Part 1, pp. 72-87.

D. M. S. Watson and G. Hickling. Notts.

On the Triassic and Permian Rock of Moray [brief reference to Mansfield]. *Geol. Mag.*, September, pp. 399-402.

C. B. Wedd. See W. Gibson.

W. J. Weston. Durham.

Durham [Geological Notes]. Cambridge, pp.

Albert Wilmore. N. Counties.

A First Book of Geology. London, pp. 141.

[J. R. R. Wilson]. Lancs. and Cheshire.

Quarry Inspection Reports, 1912. Mr. J. R. R. Wilson's Report on the Liverpool and North Wales, District 6. *The Quarry*, May, pp. 123-6.

Ethel M. R. Wood. See Gertrude L. Ellis.

Horace B. Woodward. N. Counties.

Stanford's Geological Atlas of Great Britain and Ireland, with Plates of Characteristic Fossils. Third edition, London, 8vo, pp. xii.+214. With photographic supplement by Hilda D. Sharp.

W. B. Wright. N. Counties.

The Quarternary Ice Age [many references to northern glacial geology]. London, pp. xxiv.+464. Reveiwed in *Nature* by John Horne, December 24th, pp. 451-452.

REVIEWS AND BOOK NOTICES.

'Rain and Rivers, the Rev. Professor Bonney and the late Col. George Greenwood, published in the interest of historical truth, and dedicated (without permission) to the Editor of the "Cambridge Manuals of Science and Literature;' by **G. G. Greenwood, M.P.** London: Watts & Co., 16 pages, price 3d. This is a criticism of Prof. Bonney's recent work on 'Rain and Rivers,' from which it is apparent that he has not dealt fairly with regard to the work on 'Rain and Rivers' originally written by the late George Greenwood.

Studies of Trees. By **J. J. Levison.** London: Chapman and Hall, 1914, pp. x. and 253, 7s. net. This book claims to be an 'all round book on trees,' and certainly the author has brought within a very limited space, references to trees from an unusually large number of points of view, viz.: indentification, structure, uses, habits, enemies, planting, care, forestry and nature-study. A good feature, wanting in many American books, is that the scientific as well as the common names are given of the species described, this adds much to its general usefulness. Some of his descriptions of the characters are almost too brief for indentification, but the photographs are often a useful aid. The use of a few terms is unusual, e.g., where he refers to the 'leaflets' of *Tsuga*. In the structure of stems no reference is made to the bast, and we are told that the cambium and part of the sap-wood 'transport the water and food of the tree.' Useful chapters deal with insect pests and fungoid diseases, and there is an interesting chapter on the care of the woodland. The work concludes with 'an outdoor lesson on trees,' which is intended to encourage the love of trees and things beautiful, and the author has worked this into a very readable summary of the more important features dealt with in the earlier chapters of the book. There are 155 useful illustrations, mostly from photographs.

The Study of Plants: an Introduction to Botany and Plant Ecology. By **T. W. Woodhead, M.Sc., Ph.D., F.L.S.** Clarendon Press, Oxford, 440 pp., 5s. 6d. Friends of Dr. Woodhead, who have been eagerly awaiting the publication of this book, will find their highest hopes more than realised. He has succeeded in presenting elementary botany in a surprisingly fresh and interesting light; he has produced a series of drawings and photographs far surpassing anything we have seen in a book published at such a price, and he has written an elementary book so packed with original observation that the oldest student will find in it much that is new. The work is divided into five parts: Vegetative Organs, 150 pp.; Reproductive Organs, 70 pp.; Systematic Botany, 40 pp.; Common Trees and Shrubs, 45 pp.; and Ecology, 85 pp. The subject is approached mainly from the physiological standpoint, plant morphology being treated less extensively than has usually been the case, or rather morphology being subordinated and related to the study of function. This comes out very strikingly in the constant linking up of structure and function with the habitat of the plant under discussion, especially in the important section dealing with ecology. In this book more than in any elementary botany we know, we become conscious that we are studying living organisms. The plants themselves are kept before us, and the study of the structure of each organ is linked with its development: seeds with germination, roots with growth and thickening, shoots with buds and their opening, and flowers with wind pollination or insect visits or whatever the case may be; we find a chapter on 'Hibernation and the Structure of Modified Shoots,' and another on 'Movements and Attitudes of Plants.' This characteristic, together with the emphasis on physiology and plant ecology, lift the whole subject out of the atmosphere of books and classrooms, and bring it into the open-air. The book provides no temptation to cramming: it teaches the eye to see and the mind to interrogate. Teachers will find it of extreme practical value; the examples, evidently

chosen with their needs in view, are such as can easily be obtained, the figures are drawn from material commonly used in classes for nature study, and the photographs are of places such as are frequently visited on the rambles of botany students. For those who teach the life histories of common plants, important details are given, both of the plants themselves, and as to the best methods of studying them, while related information is made easily available by the admirable index. This index is a most valuable addition to the usefulness of the volume; it contains over 4,500 references with sub-indexes to all important subjects. But, apart from the subject matter itself, the most remarkable feature is the illustrations; there are over six hundred drawings, photographs and photomicrographs, of which all but a few figures are entirely new; and they have been so well drawn, photographed, and reproduced that the work is worth buying for their sakes alone. A special word is due to the printer, for type, illustrations, and general arrangement are all that could be desired; evidently the publishers have taken a pride in their work and they have produced a volume thoroughly worthy of the Clarendon Press.

T. A. J.

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We are glad to see that a past President of the Yorkshire Naturalists' Union, Prof. A. C. Seward, F.R.S., has been elected master of Downing College, Cambridge.

No 54 of the *Old Lore Series* issued by the *Viking Society* contains many interesting records of northern life. There is an illustration of a 'Blogaben,' the name given to one of the bones of a halibut, carried by boatmen to insure good luck.

From Mr. Arthur Bennett we have received two interesting reprints from the *Transactions of the Botanical Society of Edinburgh* on *Juncus tenuis*, Willd.: Its Distribution in the British Isles,' and '*Hydrilla verticillata*, Caspary, in Great Britain.'

We have received the *Twenty-first Annual Report, Sectional Reports and Records of the Year* 1914-15, issued by the Midland Railway Natural History Society (24 pages). There are records in many branches of natural science, and also reports on archæology.

Reprinted from the Proceedings of the United States National Museum we have received a valuable 'Report on Some Carbonic Acid Tests on the Weathering of Marbles and Limestones,' by George P. Merril. The experiment seems to be confined to American rocks.

After some considerable delay, two parts of 'The Birds of the Huddersfield District' (Nos. 15 and 16, and Nos. 17 and 18 respectively) have appeared, with coloured illustrations. As the work is to be complete with 20 parts there seems to be some prospect of this being done.

In connection with the forthcoming meeting of the British Association at Manchester, we learn from *The Times* that 'Dr. Dalton will give an exhibition and explanation of diagrams illustrating his atomic theory.' This must be one of Sir Oliver Lodge's 'rat-tat at the past' tricks, as ordinarily Dr. Dalton has been dead since 1844.

Leaflet No. 132, issued by the *Board of Agriculture* is a somewhat remarkable pamphlet dealing with slugs and snails. The author's name is not given. The species seem to be classified as grey field slug, bulb or root-eating slug, black slug, yellow or household slug, the large garden snail, wood snail, strawberry snail, and small-banded snail.

From the President of the Yorkshire Naturalists' Union we have received an interesting reprint from *The Journal of Botany* dealing with the 'Mycetozoa of Australia and New Zealand.' The material was collected during Mr. Cheesman's trip with the British Association. Mr. G. Lister supplements the notes with details of the various species collected.

"A really useful contribution to economic science."

Yorkshire Evening Post.

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The "Oxford Magazine" says:—"We have not space to do justice to Mr. TOOGOOD'S contentions; we can only recommend his pamphlet to the student of industrial relations, and observe that it is worth a good deal more than sixpence."

Some Geographical Factors in the Great War

By T. HERDMAN, M.Sc., F.G.S.

(Lecturer in Geography, Municipal Training College, Hull).

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THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
THE MUSEUMS, HULL;
AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
TECHNICAL COLLEGE, HUDDERSFIELD.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, F.R.S. F.L.S., GEO. T. PORRITT, F.L.S., F.E.S.,
Prof. P. F. KENDALL, M.Sc., F.G.S., JOHN W. TAYLOR, M.Sc.,
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YORKSHIRE'S CONTRIBUTION TO SCIENCE

(Based upon the Presidential Address to the Yorkshire Naturalists' Union, delivered at the Leeds University)

BY T. SHEPPARD, M.SC., F.G.S., F.R.G.S., F.S.A.(SCOT.)

THIS work has been considerably extended, and occupies over 200 pages. It contains an account of the various scientific publications issued from Ackworth, Addingham, Barnsley, Ben Rhydding, Beverley, Bradford, Doncaster, Driffield, Goole, Halifax, Harrogate, Haworth, Hebden Bridge, Huddersfield, Hull, Idle, Ilkley, Keighley, Leeds, Malton, Middlesbrough, Pocklington, Pontefract, Ripon, Rotherham, Scarborough, Sedbergh, Selby, Settle, Sheffield, Wakefield, Whitby and York. In addition there is an exceptionally complete bibliography of the various natural history journals and publications, now issued for the first time. The author has been successful in obtaining many publications not in the British Museum.

EXTRACT FROM PREFACE:—

IN the following pages an effort is made to indicate the various sources of information likely to be of service to a student in his work on any branch of natural science dealing with our broad-acred shire. The section arranged topographically under towns shows what has been accomplished in each place, while the remainder of the book is devoted to an enumeration of the general sources of information which should be consulted. Unfortunately, several of the items are scarce, in many cases only one set being known, a circumstance which has induced me to give the bibliographical details rather fully. By a series of fortunate circumstances, and as a result of several years' collecting, I possess sets of most of the publications mentioned, and shall endeavour to arrange that they remain intact for the benefit of future workers, as it will certainly be very difficult, if not impossible, to get such a collection together again.

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YORKSHIRE NATURALISTS' UNION.

ANNUAL MEETING OF THE ENTOMOLOGICAL SECTION.

President.—W. J. FORDHAM, M.R.C.S., F.E.S., Bubwith.

Two meetings will be held in the Zoological Department of the Leeds University, by the invitation of Professor Garstang, on Saturday, October 30th, 1915.

Business at the afternoon meeting to commence at 3-30: to consider and pass the Sectional Reports for 1915, and to elect Officers for 1916.

The evening meeting will commence at 6-30, and exhibits of all orders of insects are invited. Several addresses on entomological topics will be contributed by the members.

It is of importance that exhibitors should attach their names to their exhibits, and label specimens with names and localities, as this would greatly add to the interest.

The various Secretaries earnestly solicit notes and records made during the season on entomological subjects in the county, which should be sent to them at once, as a general report is required as soon as possible.

Officials of Affiliated Societies are requested to notify their members.

Secretaries.—(Lepidoptera), A. Whitaker and B. Morley; (Coleoptera), Dr. Fordham; (Hymenoptera, Hemiptera and Diptera), Rosse Butterfield; (Neuroptera, Trichoptera and Orthoptera), G. T. Porritt.

NOTES AND COMMENTS.

BRITISH ASSOCIATION.

Under the shadow of the war cloud the members of the British Association met at Manchester from the 7th to the 11th September. Notwithstanding a certain gloominess, the sections devoted themselves to serious work, in which the subjects of war and women, and the effects of war, and the work which women had done or could do, played an important part. We may be mistaken, but our impression was that this year there were more women taking part in the proceedings than usual. Having regard to the number of the younger members who are serving their country, to the lack of travelling facilities, and the absence of the usual elaborate arrangements for entertaining the members, the attendance this year, viz., 1439, may be considered very satisfactory.

THE PRESIDENT.

Probably the attendance of distinguished scientists is larger this year than might have been expected under the circumstances of the restricted programme. But, as stated in *The Yorkshire Observer*, many have felt it a duty to put in an appearance to demonstrate their repudiation of an attempt made to boycott the President (Professor Arthur Schuster, F.R.S.). 'To the neurotic, spy-smelling journalism of some quarters of London such a combination of letters as 'Sch' in the President's name is intrinsically unpatriotic, even traitorous, and so with an easy contempt for facts the demand was made, with all the impudence of ignorance, that the President should retire.' Dr. Schuster has been called by his own friends 'an international medium of science,' but it happens that he comes of Swiss race—not of German—and his family have been associated with Manchester for nearly a century. Even were it otherwise, his half-century of work in England and the lustre he has shed upon English science as a fellow-worker with Lord Rayleigh and Clark Maxwell in the famous school of physics at Cambridge, has well earned honour, while his patriotism—testified by his having given sons and nephews to the Army and his own time and genius to organising, as secretary of a committee, the services of the Royal Society for the advantage of the Government—is beyond question. That distinguished Yorkshireman and brother physicist, Professor Silvanus Thompson, described the attack on Professor Schuster as 'one of the meanest things that has ever been done in the much abused name of patriotism,' and the warmth of the welcome accorded to the President showed that the members were quite of that opinion.

THE SCIENTIFIC MIND.

The main subject of the presidential address was a little academic. Dr. Schuster set himself to define the 'scientific mind,' quoting extensively and aptly from the brilliant mathematician and philosopher who is brother to the present President of the French Republic. He came to the conclusion that there was no essential difference between the successful scientific mind and the successful mind in any other sphere of business in which theory is combined with practice. The great preoccupation of the war could not be kept out altogether, and incidentally the President had a word for those perfervid patriots who in the intervals of assailing Mr. Asquith and Lord Kitchener cry aloud for 'government by business men' and 'government on scientific lines.' Either these desiderata are the same thing, said the President, in effect, or they are different. If they are different, then we may cancel one set of the agitated and vociferous against the other set. If they both mean the same thing, then government by business men upon scientific lines is just what this nation has got.

THE WORK OF THE BRITISH ASSOCIATION.

Of lesser general importance, but of no little domestic interest, were a few rather cryptic observations which the President introduced as preface to his address. He announced that proposals were before the Council directed to secure greater continuity in the work of the Association, and also its better co-ordination with that of other scientific organisations. In this respect the unspoken comment of his hearers was probably, 'Quite time, too,' for scientific folk have long been dissatisfied with the British Association meetings. Some very important committees, which report from year to year—and get half a line of recognition on the programme, and as much of the time of one section as suffices to read the head-line of a report—are doing most valuable work, and some joint meetings of sections for discussion are useful and suggestive. But the readers of individual papers often feel themselves ploughing the sands. Their papers may be interesting enough, but they are published only in the briefest and scrappiest summary and after long delay, and unless they secure publication in the technical journals and magazines, their treatises can be accounted stillborn. Some papers, on the other hand, ought never to have been read at all! This year, however, many of the 'bores' were absent.

ITS EARLY YEARS.

But the intimation of the President was associated with some remarks in which were contrasted the ideals of two opposing bodies of the founders. When the British Association originated in York eighty-four years ago, the whole idea of

such a popular ' picnic of science ' was scouted by many of the professorial scientists of the Universities, who rather resented the intrusion of the laymen and the amateur into their well-endowed patrimony. But the laymen—men like Vernon Harcourt and John Phillips, of York, the latter not till afterward a professor and till the end of his life an amateur in the best meaning of the word—with the inspiration and aid of such brilliant ' outsiders ' (from the University point of view) as Brewster and Dalton, made a success of the enterprise. When it was apparent that they would be done without, the university professors came in, but the faction feeling was for a long time strong in favour of confining membership to the select few—the really learned, with a sort of condescending or rather, perhaps, fawning concession to ' the nobility, clergy, and gentry.' Something of this old exclusiveness, this rather pedantic disdain for the vulgar herd, has been evident in recent years in some contemptuous references to picnics and garden parties. But garden parties and external attractions mean members—members means guineas—and a well-stored coffer enables much important and expensive research to be subsidised. So that if the scientific mind is a business mind, as the President suggested, it is not quite easy to understand to what end his reminiscences of the old controversy were directed.

SCIENCE AND HUMANITY.

The President concluded by stating that he was drawing no ring round a privileged class, but urged that the hunger for intellectual enjoyment is universal, and everybody should be given the opportunity and leisure of appeasing it. The duty to work, the right to live, and the leisure to think, are the three prime necessities of our existence, and when one of them fails, we only live an incomplete life. In the struggle which convulses the world, all intellectual pursuits are vitally affected, and science gladly gives all the power she wields to the service of the State. Sorrowfully she covers her face because that power, accumulated through the peaceful efforts of the sons of all nations, was never meant for death and destruction ; gladly she helps, because a war wantonly provoked threatens civilisation, and only through victory shall we achieve a peace in which once more science can hold up her head, proud of her strength to preserve the intellectual freedom which is worth more than material prosperity, to defeat the spirit of evil that destroyed the sense of brotherhood among nations, and to spread the love of truth.

THE HANDBOOK.

Unfortunately the handbook issued by the local committee, edited by H. M. McKechnie, is not up to the usual standard, and is even issued in paper covers, which is some

indication of the local committee's own estimation of its worth. It contains just over 100 pages with a brief supplement issued separately, without covers, and is, perhaps, more accurately described by its title, 'Manchester in 1915.' There are articles on the various Manchester Institutions, but we miss the valuable accounts of the geology, natural history and archæology, etc., of the district, which usually appear in these publications. From the preface we gather that originally the committee responsible for this production was going to produce an even smaller volume, but owing to the generosity of the various people invited to contribute articles, it is even larger than was contemplated! Apparently this decision was arrived at without any considerations due to the war. As we feel sure many members value these local handbooks as guides to the respective districts, it seems a pity that Manchester was so cheese-paring in its policy. In the case of our own copy we have to hesitate whether to go to the expense of binding in order to preserve it. Unquestionably the articles appearing are excellent, but they do not seem to go far enough.

IS EUROPE 'SETTLED'?

In the Geological Section, Professor Grenville A. J. Cole (Royal College of Science, Dublin), in his presidential address, discussed problems relating to the earth's crust and crust movements. He said the globe was still strange to us because its vast interior was unseen, and we were apt to speculate about the stars, when the behaviour of the ground beneath concerned us far more nearly. In spite of the swamping of the Alkmaar country in 1825, in spite of the tragedy of Messina only seven short years ago, we feel that Europe is a settled continent, and we judge the past and future by the present superficial peace. We have applied the same thoughts to human movements, and the inconceivable has happened in our midst. We naturally find it difficult to carry our minds back to epochs when the earth-blocks may have parted asunder as ice parts across the polar seas. We have, however, still very much to learn about causes now in action; and the mystery of the earth, and of our connexion with it, grows upon us as we learn.

THE GREATEST CHANGE.

Can we at all realise the greatest change that ever came upon the globe, the moment when living matter appeared upon its surface, perhaps over a few square miles? Matter is either dead or living, that is, endowed with life; there is no intermediate state. And here was living matter, a product of the slime, if you will, but of a slime more glorious than the stars. Was this thing, life, a surface-concentration, a specialisation, of something that had previously permeated all matter, but had remained powerless because it was infinitely diffuse? Here you will perceive that

the mere geologist is very much beyond his depth. Let us return to our orderly studies, our patient hammerings, our rock-slices, our chiselling out of fossil shells. Behind it all is the earth itself, quiescent, it may be, but by no means in the sleep of death. As Termier puts it, 'La planète n'est pas encore morte ; elle ne fait que dormir.'

PROF. W. R. SCOTT'S ADDRESS.

A strong note on current topics was sounded in Prof. W. R. Scott's address to the Economic Science and Statistics Section. Not the least dominant phase of the present epoch-making struggle is the economic one ; and it is inevitable that consideration should be given to some of the reactions of this great war upon industry, credit and finance. In many repsects the economic problems that will confront us after the war will be even more serious, and certainly not less difficult, than those of the present time. Still there can be no doubt that these will be faced with courage and patience. The period of stress through which we are passing has shown the unity of thought and purpose throughout the whole Empire. And this, in spite of many appearances to the contrary, will be a great asset in the future. The great national emergency has caused a closing of the nation's ranks, and it rests with us to keep them firm and steadfast when peace returns. There are plain signs that it may not always be easy, since so many industrial and other difficulties have been carried forward as a suspense account which is to be dealt with when the war is over. National unity is enabling us to progress towards victory, and the same unity will be required to enable us to reap the full fruits of that victory at home. It would be a mad waste not to employ the qualities of heart and mind which have been aroused in this great struggle in the service of peace and social progress. The future may be difficult for some years to come, but difficulties are the opportunities of the strong and courageous. It has fallen to us to live in an heroic age ; and, if we remain true to ourselves and to our high destiny, we shall have the strength and the fixity of purpose to achieve greatly in peace as well as in war.

MR. R. H. REW'S ADDRESS.

Similarly in his address to the Agricultural Section, Mr. Rew referred to the effect of war especially on farming and on food supplies. In total weight of food-stuffs, the quantity brought to our shores was rather larger in time of war than in time of peace. Yet one still occasionally meets a purblind pessimist who plaintively asks what the Navy is doing. This is a part of the answer. It is also a measure of the success of the much-advertised German 'blockade' for the starvation of England. So absolute a triumph of sea-power in the first

year of war would have been treated as a wild dream by the most confirmed optimist two years ago. The debt which the nation owes to our sailor-men is already immeasurable. That before the enemy is crushed the debt will be increased we may be assured. The crisis of our fate has not yet passed, and we may be called upon to meet worse trials that have yet befallen us. But in the Navy is our sure and certain hope. 'That which they have done is but earnest of the things that they shall do.' Under the protection of that silent shield the land may yield its increase untrodden by the invading foot, the trader may pursue his business undismayed by the threats of a thwarted foe, and the nation may rely that, while common prudence enjoins strict economy in husbanding our resources, sufficient supplies of food will be forthcoming for all the reasonable needs of the people.

MAJOR H. G. LYONS'S ADDRESS.

The importance of Geographical Research, a particularly important topic at the present time, was the subject of Major Lyons's address to the Geographical Section. He opined that societies can do far more good in the promotion of geography as a science by assisting competent investigators, by the loan of books and instruments, and by giving facilities for the discussion and publication of technical papers, than by undertaking the investigation of problems themselves. Among the earlier Presidential Addresses of this Section some have laid stress on the importance of the recognition by the State of geography in education; others have represented the great part which the Geographical Societies have played in supporting and advancing the subject; others again have urged the fuller recognition of geography by Educational Institutions. I would on this occasion attach especial importance to the prosecution of serious research by individuals in any branch of the subject that is accessible to them, to the discussion of the results of such work by others of like interests, and to the publication of such studies as having a real value in promoting the advancement of scientific geography.

PROF. W. H. LANG'S ADDRESS.

In his address to the Botanical Section, Prof. Lang dealt with Phyletic and Causal Morphology, Individual Development, The Constitution of the Shoot, Alternation of Generations, and The Seed and its Embryo. Prof. Lang concluded that though results may seem far off, we must not slacken, but redouble our efforts towards the solution of the fundamental problems of the organism. This can be done without any antagonism between pure and applied botany; indeed, there is every advantage in conducting investigations on plants of economic importance. It would be well if every botanist made himself

really familiar with some limited portion of applied botany, so as to be able to give useful assistance and advice at need. The stimulus to investigation would amply repay the time required. Even in continuing to devote ourselves to pure botany we cannot afford to waste time and energy in purposeless work. It is written in ' Alice in Wonderland ' that ' no wise fish goes anywhere without a porpoise,' and this might hang as a text in every research laboratory. A plant is a very mysterious and wonderful thing, and our business as botanists is to try to understand and explain it as a whole and to avoid being bound by any conventional views of the moment. We have to think of the plant as at once a physico-chemical mechanism and as a living being ; to avoid either treating it as something essentially different from non-living matter or forcibly explaining it by the physics and chemistry of to-day. It is an advantage of the study of causal morphology that it requires us to keep the line between these two crudities, a line that may some day lead us to a causal explanation of the developing plant and the beginnings of a single science of botany.

MRS. HENRY SIDGWICK'S ADDRESS.

Mrs. Sidgwick was the President of the Educational Science Section, and expressed the opinion that the general public must be encouraged to take its share even in the part of education carried on at school and college, and in particular those members of the general public who are parents of pupils. But this conclusion is rather barren, for she had no very definite plan to suggest for carrying it out. The State cannot now, even if it would, abandon the responsibility for the elementary school education of the children, and even if it could, it is more than doubtful whether it would be desirable. For though we have now secured that all parents shall themselves have had school education, we still cannot trust them all voluntarily to give that advantage to their children. So the drawback must be put up with that parents cannot feel the same degree of responsibility resting on themselves when the responsibility is undertaken by the State. It is to be hoped, however, that we shall be very careful how far we entrust to the State the regulation of education higher than the primary. Bureaucratic regulation may be well adapted to produce German *Kultur,* but it is not the way to secure the attitude of mind which leads to freedom, independence of thought, and culture in the best sense. And it is very apt to lead to want of independence in the teacher. Probably our best hope for progress in the right direction lies in movements like the Workers' Educational Association, where we have voluntary effort put forward to satisfy spontaneous desire to learn. As this movement extends we hope more and more to get a generation

of parents who, having themselves experienced intellectual curiosity and the joy of satisfying it, who, having themselves felt the gain of a wider outlook on men and things, may by their example inspire their children with a similar disinterested desire for learning and culture.

PROF. W. M. BAYLISS'S ADDRESS.

The Physiological Importance of Phase Boundaries was the subject of Prof. Bayliss's address to the Physiological Section. He stated that we may conclude that more study of the phenomena at phase boundaries will throw light on many problems still obscure. It would probably not be going too far to say that the peculiarities of the phenomena called 'vital' are due to the fact that they are manifestations of interchange of energy between the phases of heterogeneous systems. It was Clerk Maxwell who compared the transactions of the material universe to mercantile operations in which so much credit is transferred from one place to another, energy being the representative of credit. There are many indications that it is just in this process of change of energy from one form to another that special degrees of activity are to be observed. Such, for example, are the electrical phenomena seen in the oxidation of phosphorus or benzaldehyde, and it appears that, in the photo-chemical system of the green plant, radiant energy is caught on the way, as it were, to its degradation to heat, and utilised for chemical work. In a somewhat similar way, it might be said that money in the process of transfer is more readily diverted, although perhaps not always to such good purpose as in the chloroplast. Again, just as in commerce money that is unemployed is of no value, so it is in physiology. Life is incessant change or transfer of energy, and a system in statical equilibrium is dead.

PROF. E. A. MINCHIN'S ADDRESS.

Prof. Minchin's address to the Zoological Section was on a well-worn topic, 'The Evolution of the Cell,' but was dealt with in the light of recent work. He stated: 'I have set forth my conceptions of the nature of the simplest forms of life and of the course taken by the earliest stages of evolution, striving all through to treat the problem from a strictly objective standpoint, and avoiding as far as possible the purely speculative and metaphysical questions which beset like pitfalls the path of those who attack the problem of life and vitalism. I have, therefore, refrained as far as possible from discussing such indefinable abstractions as 'living substance' or 'life,' phrases to which no clear meaning can be attached. How far my personal ideas may correspond to objective truth I could not, of course, pretend to judge. It may be that the mental pictures which I have attempted to draw are to be assigned,

on the most charitable interpretation, to the realm of poetry, as defined by the greatest of poets, rather than of science.

> " The lunatic, the lover and the poet
> Are of imagination all compact;
> . . . . . .
> And as imagination bodies forth
> The forms of things unknown, the poet's pen
> Turns them to shapes and gives to airy nothings
> A local habitation and a name." '

PROTOCYTE, CYTODE, MICROCOCCUS AND BIOCOCCUS.

' If I might be permitted to attempt an impartial criticism of my own scheme, I think it might be claimed that the various forms and types of organisms in my evolutionary series, namely, the simple cell or proctocyte, the cytode or pseudo-moneral stage, the micrococcus, even the biococcus, are founded on concrete evidence and can be regarded as types actually existent in the present or past. On the other hand the *rôle* assigned by me to each type in the pageant of evolution is naturally open to dispute. For example, I agree with those who derive the Bacteria as primitive, truly non-cellular organisms, directly from the biococcus through an ancestral form, and not at all with those who would regard the Bacteria as degenerate or highly-specialised cells. But the crux of my scheme is the homology postulated between the biococcus and the chromatinic particle—chromidiosome or chromiole—of true cells. In support of this view, of which I am not the originator, I have set forth the reasons which have convinced me that the extraordinary powers and activities exhibited by the chromatin in ordinary cells are such as can only be explained on the hypothesis that the ultimate chromatinic units are to be regarded as independent living things, as much so as the cells composing the bodies of multicellular organisms; and, so far as I am concerned, I must leave the matter to the judgment of my fellow-biologists.'

SIR F. W. DYSON'S ADDRESS.

In his addresses to the Mathematical and Physical Science Section, Sir F. W. Dyson dealt with ' The Construction of the Heavens.' After a very clear statement of recent researches, he stated that it must be admitted that we are as yet very ignorant of the more distant parts of the ' island universe.' For example, we can make little more than guesses at the distance of the Milky Way, or say what part is nearest to us, what are its movements, and so on. But nevertheless, the whole subject of the Construction of the Heavens has been opened up in a remarkable manner in the last few years. The methods now employed seem competent to produce a tolerably good model showing the co-ordinates and velocities of the stars

as well as their effective temperatures and the amount of light they radiate. Industry in the collection of accurate data is required, along with constant attempts to interpret them as they are collected. The more accurate and detailed our knowledge of the stellar system as it is now, the better will be our position for the dynamical and physical study of its history and evolution.

PROF. C. G. SELIGMAN'S ADDRESS.

In his address to the Anthropological Section, Prof. Seligman outlined the early history of the Anglo-Egyptian Sudan from the standpoint of the ethnologist. He stated that concerning the early pre-history of the Anglo-Egyptian Sudan we have no more than indications. In the Neolithic stage, which appears to have persisted until a comparatively recent date, Negro influence, if not predominant over the whole area, was at least powerfully felt even in the north, as is shown by the distribution of polished axe-heads. But against this northward pressure must be set the continual extension of Egyptian culture, the evidence for which may best be found in the eschatological ideas and burial customs (' mummification ' and anthropoid coffins) of the peoples of Equatoria. This influence, which seems to have persisted until mediæval times, may have reached tropical Negroland as early as the Middle or even the Old Kingdom. Nor was the Nile route the only one by which Egyptian influence was spread. Another and later drift extended westwards as shown by the coinage of the north African States, which enables us to fix its date within fairly precise limits. We do not know how far south this drift travelled, but it seems certain that it reached at least as far as the Senegal River and the great bend of the Niger.

MUSEUMS.

The Committee appointed to examine the Character, Work, and Maintenance of Museums reported that during the year it had carried out extensive inquiries upon various aspects of museums in relation to Education. Sectional Reports upon the museum needs of school children, students, and the general public have been drawn up by sub-committees, and afterwards issued to all the members. A lengthy questionnaire was prepared by the Committee in the hope of its adoption by the House of Lords for departmental issue to all museums. Owing to the war, this was not possible, and the questionnaire was therefore issued by the Committee on its own responsibility to all provincial museums in the British Isles. About one hundred and forty replies have been received, and are now under consideration. A special questionnaire upon classical education in relation to museums has also been issued. A joint conference between the Committee and the Museums Association

was held at the Victoria and Albert Museum, London, on July 9th, when Professor J. A. Green introduced the question of the museum in relation to schools. Attention is also being directed to the question of the relation of museums to universities. The Committee hopes to complete its labours during the course of the coming year.

THE PLACE OF MUSEUMS IN GENERAL EDUCATION.

Professor W. Boyd Dawkins stated the value of museums in general education depends upon their arrangement, and their being classified so as to show the true relations of the various objects to one another. He put before the Section a scheme of classification based on his experience in Manchester dating from 1869, in combining various scattered collections into one museum, which is now of equal service to the University, to the various schools and institutions of the district, and to the general public. What has been done here on a fairly large scale may be done with equal success on a small scale elsewhere. The difficulty of co-ordinating the widely different groups of objects of human interest has been overcome by the adoption of the principles of time and evolution as the basis of classification, as seen in the following scheme :—

Modern History of the Earth.	VI. Animals. | VIII. Man. | VII. Plants.	VIII. History, Anthropology, Ethnology, Art. VII. Botany. VI. Zoology.
	V. Tertiary Life (Cainozoic).	V., IV., III., II., I. Geology.
	IV. Secondary Life (Mesozoic).	V., IV., III. Palæontology.
Ancient History of the Earth.	III. Primary Life (Palæozoic).	
	II. Rocks.	II. Petrology.)
	I. Minerals.	I. Mineralogy.

SCHEME OF ARRANGEMENT.

In this scheme the minerals are placed at the bottom because they are the materials forming the rocks. The existing animals and plants stand at the top in their true relation to the geological record, and the various changes, which they have undergone in becoming what they are, fix the geological age of the rocks in which they lie. The place also of the collections illustrationg History, Anthropology, and other subjects grouped together in No. VIII., in close relation with those of Zoology, Botany (VI., VII.), and Geology (I. to V.), is fully justified by the connection between those sciences, and

more particularly by the appearance of man in the geological record. The continuity is so marked that the present face of nature may be taken to be the current, but not necessarily the last, of the stages of the evolution of life in the Tertiary Period. A museum arranged on these lines, made intelligible by lectures and addresses, cannot fail to become an important instrument in a system of education in which the study of things is becoming at least as important as the study of books.

LOCAL MUSEUMS,

In opening a discussion on 'Local Museums' at the Conference of Delegates, Dr. W. E. Hoyle proposed 'merely to throw down certain bones of contention for those present to worry to their hearts' content.' He stated that 'May I lay it down at the outset that the first and fundamental function of a museum is to preserve. We museum officials are now-a-days given so much good advice about the desirability of making our exhibits aesthetically attractive, of compiling explanatory labels which shall at the same time instruct the specialist and interest the casual visitor, and of catering for school children, that we are, perhaps, in danger of forgetting that our paramount duty is to see that "neither moth nor rust doth corrupt" and that "thieves do not break through nor steal." It always tends to clearness of thought in approaching any subject to begin with a definition. I will, therefore, provisionally define a local museum as a museum existing in a place, belonging to that place, destined for the instruction and delight of the dwellers in that place and illustrative of that place.'

AND THEIR DUTY.

'It follows from this that the first duty of a local museum is to preserve the things of interest pertaining to the locality, whether they illustrate its history, folk-lore, natural history or any other topic. These must be carefully kept and every particular relating to them recorded with scrupulous accuracy. A certain proportion must be exhibited in such a way that their points of interest may be readily seen and they must be adequately labelled—all this in accordance with principles which are now-a-days well understood by every qualified museum official. Complete reference collections of animals, plants, fossils and the like, must be formed and kept in cabinets accessible to those desiring to make use of them for purposes of study.'

NATIONAL *v.* PROVINCIAL.

'Here, I think, it is necessary to consider the important and delicate question, "What ought to be the relations between the Local Museum and the National Museum?" Broadly stated, the solution is to be found in the general principle,

what is of national importance should be preserved in the national museum, what is of merely local interest should be kept in the local museum.' Quite so, but who is going to define what is of local interest, and what is of national interest? It is purely a question of the point of view. When Dr. Hoyle adorned one of our provincial museums, he in some way 'acquired' certain objects which he then certainly considered were suitable for that museum. Now, however, that he governs one of our national institutions it seems quite likely that he may be of the opinion that many of the objects in the Manchester Museum are of sufficient importance to be transferred to a national museum, perhaps even in Wales. In fact we believe, judging from his reports, that some of the collections he has purchased for the Welsh National Museum would be considered by his successor at Manchester to be more appropriately housed at Manchester, and were Dr. Hoyle still at Manchester, that would doubtless be his view.

LOCAL MUSEUM'S DUTY.

'It having been admitted that the formation and preservation of a local collection is the primary duty of a local museum, and supposing this function to be adequately discharged, should a local museum undertake any others? I should say "Certainly, if its means and opportunities allow, and the possibilities are many and various." One obvious way in which the museum can be of the greatest service is by providing collections which shall give the visitor a preliminary sketch of some department of knowledge. I allude to what are often called "Index" collections, though the term "Introductory" collections would be more appropriate.'

INTRODUCTORY COLLECTIONS.

'For instance a larger and smaller collection illustrating the animal kingdom would furnish a suitable preliminary to a study of local fauna, a series of specimens showing the technique of different processes of engraving, etching and mezzotint would furnish a valuable introduction to a collection of local prints, a number of objects from different prehistoric and historic periods would enable the visitor to place in their proper chronological relation the collections of local archæology, and numerous other possibilities will readily suggest themselves. Another direction in which a local museum may profitably develop is by coming into direct connection with the educational system of the locality. This may be done either by setting apart and furnishing a room for the special use of school classes or by providing topical collections which can be lent to, or circulated among the schools. There is already an extensive literature on this subject so I need not enlarge further upon it.'

' DISCUSSION ! '

What perhaps might be described as a ' discussion' certainly followed Dr. Hoyle's paper, but as it resolved itself into an account of the good things done at the museums in the towns represented by the various delegates who spoke, the discussion might very easily have taken place at another Association which we know very well.

PROVINCIAL SOCIETIES.

Sir Thomas Holland presided at a meeting of delegates from corresponding societies, and spoke upon the necessity for organisation of scientific and learned societies. He said that the war would result, more completely than any of its puny predecessors, in recasting our national ideas, economical, political, and literary, and of the lessons we were likely to learn the one that so far promised most to affect the life of the nation might be summed up in the word ' organisation.'

GERMAN *v.* ENGLISH METHODS.

' In Germany the scientific, technical, and commercial community was mobilised, and each individual in it was given his appropriate function. In this country still, in these institutions, we had the right men in the wrong places, while scientific activity seemed to be devoted to the voluntary formation of innumerable and often irresponsible committees with overlapping functions and no apparent common aim in view, and with convergent interests. The plan that had often occurred to him as a possible compromise between the claims of central organisation and provincial autonomy, was this. The recognised chief among the learned societies—the Royal Society of London—should, by affiliation of its provincial poor relations, take over the cost as well as the responsibility of their serious publications. They would enjoy home rule so far as their meetings, discussions, and finances were concerned, but their papers offered for publication would be censored by the appropriate sectional committees of the Royal Society, and would rank technically for purposes of quotation and priority.'

A DANGER.

This may be alright theoretically and, as we have pointed out on many occasions, an examination of the publications of the various societies, metropolitan and provincial, is a difficult problem. But it must be remembered that this London ' censorship ' may do harm. In the first place quite a number of important local notes and records would certainly be ' censored ' by a central governing and a central paying body. ' A List of the Diptera of Hull,' or ' An Account of a Ramble of the Yorkshire Naturalists' Union at Elland,' or a ' List of the Fungi of Halifax,' would in all probability be considered of insufficient importance from a Royal Society Committee's

point of view. But workers in the county know how necessary and how valuable these local records are, and we know that professors and other quite important people find these local lists useful.

LONDON *v.* PROVINCES.

Besides, as in the case of deciding on the objects to be placed in a local or in a national museum, so the difficulty will arise with publications, as to whether they are of London or provincial importance. And, just as a donor may have some say as to the destination of his gifts, so an author may want some voice in the matter of the place of publication of his work. We believe Sir Thomas Holland suggested that the local societies might still issue an annual report, with ephemeral matter which, presumably, the superior scholar may afford to ignore. But it is more than probable that some of these 'unimportant' notes and records may be very important in the future. We know how, over and over again, commonplace records of one generation have been of the utmost value to another. Pepy's Diary would have been censored by the London referee had he submitted it for publication in his day. As it is, it throws a vivid light on the life of his times, and is now a classic.

THE AMATEUR NATURALIST.

But there is another point to be considered; and an important one. In most of our provincial societies the amateur naturalist receives encouragement and inspiration. Quite a large number of our professional scientific men began their career in a provincial scientific society. Their early papers were read at its meetings; their first encouragement was received there. What would the effect upon these young naturalists be if their first papers had to be submitted to a Royal Society's Committee in London? In most cases the papers would certainly be 'censored.' Politely, perhaps, but firmly, they would be told that their work was not up to 'standard' and could not be printed. This is not encouragement. And it is to the encouragement given to their maiden efforts that so many of our professional scientific men owe the positions they hold to-day. No; our methods may not be perfect; they may not be German, but before any such change as that suggested takes place, the matter should be *very* carefully considered.

THE ANTIQUITY OF MAN.

On this subject Prof. Boyd Dawkins made an important contribution. Professor Boule, in his masterly essay published in *Anthropologie*, xxvi., Jan.-April, 1915, freely criticised the evidence on which the antiquity of man in Britain has been stated to go back beyond the early Pliocene age, and concludes that it is not of a nature to throw light on so important a prob-

lem. The antiquity of man—or, in other words, his place in the geological record—is a geological question to be decided, like all others, on the lines of a rigid induction. In each case it is necessary to prove not only that the objects are of human origin, but further that they are of the same age as the strata in which they occur, without the possibility of their having been introduced at a later time. The Pliocene age of man in East Anglia is founded entirely on the roughly chipped flints in the basal Pliocene strata—on eoliths, mainly of the rostro-carinate or eagle's-beak type of Moir and Lankester. It has been amply proved in this country by Warren, Haward, and Sollas, and in France by Boule, Breuil, and Cartailhac, that these can be made without the intervention of man by the pressure and movement of the surface deposits, by the action of ice, by the torrents and rivers, and by the dash of the waves on the shore. The type specimens taken to be of human work have been selected out of a large series of broken flints that graduate into forms obviously made by natural fractures. They are, as Boule aptly says, 'hypersélectionnées,' and can only be rightly interpreted by their relation to the other flints on the Pliocene shore-line.

GEOLOGICAL EVIDENCE IN BRITAIN.

'As might be expected, if they are due to natural causes, the "rostro-carinates" are widely distributed through the basal beds of the crag in Norfolk and Suffolk. They occur also in the Upper Miocenes of Puy-Courny (Auvergne), in the Pleistocene gravels of London, and the present shore-line of Selsey, where they are now probably being made by the breakers. For these reasons I agree with M. Boule that they have not been proved to have been made by man, and that therefore they throw no light on his place in the geological record. The presence of man in East Anglia during the Glacial period is founded on even worse evidence than this. The Ipswich skeleton on which Moir and Keith base their speculations was obtained from a shallow pit sunk through the surace soil of decalcified boulder clay—not of boulder clay *in situ*, as stated—into the Glacial sand that crops out on the valley slope. It is, in my opinion, a case of interment that may be of any age from the neolithic to modern times. The skeleton also is of modern type, and belongs, as Duckworth shows, to the graveyard series of burials.'

PILTDOWN REMAINS.

'We come now to the consideration of the evidence of the famous discovery on Piltdown of *Eo-anthropus Dawsoni*—the missing link between primitive man and the higher apes. After the examination of the whole group of remains, and a study of the section, I fully accept Dr. Smith Woodward's opinion that

the find belongs to the early Pleistocene period. The associated implements are of the same Chellean or Acheulean type as those so abundant in the mid-Pleistocene Brick-earths of the Thames Valley between Crayford and Gravesend. They may imply that *Eo-anthropus* belongs to that horizon, in which the stag is present and the reindeer absent. It must not, however, be forgotten that the classificatory value of these implements is lessened by their wide range in Britain and the Continent through the later Pleistocene River deposits. The stag, the beaver, and the horse of Piltdown—leaving out of account the Pliocene fossil mammals more or less worn into pebbles—are common both to the pre-Glacial Forest-bed and the Lower Brick-earths of the Thames Valley. It must also be noted that the intermediate characters of the Piltdown skull and lower jaw point rather to the Pliocene than the Pleistocene stage of evolution. We must wait for further evidence before the exact horizon can be ascertained. On the Continent there is no such difficulty.'

EARLY MAN ON THE CONTINENT.

'The earliest traces of man are there represented at Mauer by a mandible associated with the peculiar fauna of the Forest-bed, showing that *Homo Heidelbergensis*, a chinless man, was living in the Rhine Valley during the earliest stage of the Pleistocene. The Neanderthal man, thick skulled and large-brained, with small chin and stooping gait, belongs to the Mousterian stage, that, in my opinion, is not clearly defined from the Chellean and Acheulian gravels of the Late Pleistocene. He ranged from the Rhine through France southwards as far as Gibraltar, and was probably the maker of the Palæolithic implements of those strata throughout this region. It is also probable that he visited Britain, then part of the Continent, in following the migration of the mammalia northward and westwards. While primitive men of these types inhabited Europe there was no place in the Pleistocene fauna for the thin-skulled men taken by Dr. Keith* and others to prove that modern types of men lived in Britain in the Pleistocene age. Man appears in Britain and the Continent at the period when he might be expected to appear, from the study of the evolution of the Tertiary Mammalia—at the beginning of the Pleistocene age when the existing Eutherian mammalian species were abundant. He may be looked for in the Pliocene when the existing species were few. In the older strata—Miocene, Oligocene, Eocene—he can only be represented by an ancestry of intermediate forms.'

* The skeletons of Galley Hill, in Kent, and that of Cheddar Cave in Somerset, have, in my opinion, been buried, and do not belong to the Pleistocene age.

EARLY MAN

'The Rev. H. J. Dukinfield Astley stated it was unnecessary to enlarge on the classification now accomplished of Palæolithic times, chiefly from the data in the French caves. Formerly it was sufficient to differentiate the Drift and the Cave periods.* It is now realised that the Cave Period was of vast duration and consisted of a succession of well-defined epochs, as did also the Drift. Various classifications have been attempted as knowledge has improved—those of Monstrelet, Piette, Hoernes ; the latest are those of M. Rutot and the Abbè Breuil, and a careful table in the Report of the last Prehistoric Congress at Geneva, 1912. This definitely established the existence of the Aurignacian Period between the Mousterian and Solutrian periods, tentatively suggested by the Abbè Breuil at the Monaco Congress in 1906. (The names are derived from the caves containing the characteristic culture).'

IN EAST ANGLIA.

'As regards England, Professor Sollas has assigned the Paviland Cave to the Aurignacian Period, and some implements with distinctive Aurignac features have been found in Kent's Cavern and Wookey Hole. The object of this communication is to show reason for affirming the habitat of Aurignac Man in districts where no caves exist. The ' Cissbury ' type shows unmistakeable Aurignac affinities. A rich field has been lately disclosed in East Anglia—not only in the Palæolithic Floors at Thetford Warren and Lakenheath and Icklingham, so untiringly explored by Dr. Sturge, but in the now celebrated ' Grime's Graves ' near Brandon.† Mr. Reginald Smith's doubts have led to further excavations undertaken in 1914. The results show implements of undoubted Mousterian and Aurignac types, and go to prove that the original miners belonged, not to the Neolithic people, who came here when Britain was already an island, but to the Cave people, who arrived here immediately preceding the Würm glaciation, and continued after it passed away, while the British Isles still formed part of the Continent. It is suggested that the sand covering the pits is Loess.'

DISTRIBUTION OF BRONZE AGE IMPLEMENTS.

Mr. Harold J. E. Peake, Secretary of the Committee, reported that no meeting of the Committee was held during the year, but he attended the meeting of the Association Francaise, held at Le Havre in July 1914, and through the courtesy of Dr. F. Gidon, its President, was enabled to bring

* Evans, ' Stone Implements,' and Avebury, ' Prehistoric Times.'

† ' Description of Grime's Graves, Canon Greenwell's Excavations, 1870' —all assigned to the Neolithic Age.

the objects of the Committee before the Section of Anthropologie. The idea was received very cordially by those present, especially by M. A. de Mortillet, and many offers of assistance were received. The order for the mobilisation of the French army, which was issued the following day, has prevented any further communication with our allies on this subject. A considerable number of sketches and notes has been furnished referring to specimens in the museums of Newbury, Southampton, and Carisbrooke, as well as to those in several small private collections. The Committee is anxious to get sketches of all the Bronze Age Implements in the Country. Those able to assist should communicate with Mr. Peake, at Westbrook House, Newbury.

CLASSIFICATION OF TERTIARY STRATA BY MEANS OF EUTHERIAN MAMMALS.

Prof. W. Boyd Dawkins gave a classification based on the evolution of the mammalia, the only group in the animal kingdom that was, as Gaudry writes, ' en pleine évolution ' in the Tertiary Period, all the lower forms having already undergone their principal changes and none changing fast enough to be of service in defining the stages. The scheme is as follows :

Table of the Divisions of the Tertiary period.

Descriptions.	*Characteristics.*
Historic, in which the events are recorded in history.	Modern types of man. Man the master of nature.
Prehistoric, in which man has multiplied exceedingly and domesticated both animals and plants. Wild Eutheria on the land of existing species, with the exception of the Irish elk.	Modern types of man-cultivated plants. Domestic animals — dog, sheep, goat, ox, horse, pig, etc. Wild Eutheria of living species.
Pleistocene, in which living species of Eutheria are more abundant than the extinct species. Man appears.	Extinct types of mankind. (Modern types ?) Living Eutherian species dominant. Man.
Pliocene, in which living Eutherian species occur in a fauna mainly of extinct species.	Living Eutherian species present. Extinct species dominant.
Miocene, in which the alliance between living and extinct Eutheria is more close than in the preceding stage.	No living Eutherian species. Living Eutherian genera appear. Anthropoid apes. Extinct genera dominant.
Oligocene, in which the alliance between extinct and living Eutheria is more close than in the Eocene.	No living Eutherian genera. Living families and orders. Extinct families and orders numerous.
Eocene, in which the Eutheria are represented by living, as well as by extinct, families and orders.	No living Eutherian genera. Living families and orders. Lemuroids. Extinct families and orders dominant.

The most important break in the succession of life-forms occurs at the close of the Oligocene age in Europe and America. From this break down to the present day the continuity is so marked that we may conclude that the present face of the earth is merely the last in a long succession in the Tertiary Period.

GLACIAL GEOLOGY OF THE WESTERN SLOPES OF THE SOUTHERN PENNINES.

Dr. Albert Jowett dealt with the area extending from Blackstone Edge southwards to the southern extremity of the Pennines. No striated surfaces of solid rock have been discovered at high levels, and the two that have been recorded at Salford and Fallowfield serve only to indicate a general movement from N.W. to S.E. For more detailed information as to the movements of the ice-sheet, the only evidence is that afforded by the distribution of the drift at high-levels and by the systems of drainage along the edge of the ice. From this it may be inferred that the main directions of ice-movement about the time of the maximum extension of the ice-sheet were roughly towards the north-east in the Tame valley, the east in the Etherow valley, and the south-east and south-south-east in the Goyt valley and further south. These directions were much modified locally by the complicated configuaration of the sub-glacial surface. The first barrier of hills met with on approaching the Pennines from the South Lancashire and Cheshire plain was almost everywhere overridden by ice, which left definite deposits of drift with foreign rocks at altitudes up to 1,360 feet, and scattered erratic boulders up to 1,400 feet. As this foreign drift penetrates further into the hills its maximum altitude falls steadily. It has only been traced across the main Pennine divide at the broad col (1,100 feet above O.D.) south-east of Chapel-en-le-Frith.

ERRATICS.

Thick deposits of drift and big erratics are comparatively rarely met with at the extreme limit of the foreign drift, towards which the erratics generally diminish in number and in size. Boulders of local rocks, often obviously transported and uplifted beyond their parent outcrops, become relatively more abundant towards the limit of the foreign drift, and generally form a spread of drift extending beyond it and passing insensibly into the driftless area. Great lakes were held up by the ice-barrier some time after it commenced to retreat from the western slopes of the Pennines. During early stages in this retreat the drainage from the lakes in and north of the Etherow valley excaped northwards, and ultimately passed through the Walsden gap into the Calder. When the ice-barrier east of Manchester fell below 600 feet above O.D., this drainage followed the course of that south of the Etherow valley and escaped southwards. The action of the ice-sheet with its associated streams of water, together with the marginal water derived from melting ice and draining from the region beyond the ice-sheet, assisted by the action of post-glacial streams, in depositing the original drift, in cutting new channels

through rock and drift, and in resorting and redepositing the debris, seems quite sufficient to account for the complicated superficial deposits in this area.

ONE GLACIATION.

No evidence has been found of more than one period of glaciation nor of any local glacier system. There are, however, curious corrie or cirque-like features, e.g., on Shelf Moor, Glossop. Moreover, although the Pennines are on the whole much lower north of the Etherow Basin than further south, the overflow-channels of glacier-lakes can be found at higher altitudes in the former than in the latter region. This is the reverse of what might be expected if the higher ground were ice-free. It may be, therefore, that at and near the time when the ice-sheet attained its maximum development, the snow-line actually descended below the altitude of the higher Pennine hills, and, without bringing about a definite local glaciation, temporarily filled the higher hollows with snow up to the general level of the ridge. Thus, instead of the margin of the ice-sheet at that stage melting away rapidly, melting might be considerably reduced and even temporarily suspended, and the ice-sheet reinforced by the local snow-fall. Such conditions would tend to depress the limit of distribution of erratics immediately west of the highest ground, but where an ice-stream carrying erratics actually crossed the watershed, they might lead to the distribution of those erratics further and more widely than otherwise might have been possible.

THE CARBONIFEROUS LIMESTONE ZONES

Dr. Albert Wilmore stated that the sequence is well seen in the neighbourhood of Clitheroe, where numerous quarries have been opened up. The lowest beds exposed are near Chatburn Hill, and are dark, thinly-bedded limestones with calcareous shale partings. Fossils are very scarce. There is a great thickness of these almost unfossiliferous beds, the top parts of which are dolomitic. Bold Venture Quarry, Horrocksford Quarry, and several other exposures show beds in probably Lower C. with numerous small Zaphrentids (chiefly *Zaphrentis omaliusi*, with the variety *ambigua* of Mr. R. G. Carruthers very common). Higher parts of these beds contain *Caninia cylindrica*, which has been found at Brungerly Bridge, in Bold Venture Quarry, at Pimlico, and at Downham. This species is not so common or well-developed as in beds farther east, towards Hellifield and district. Among the brachiopods are *Chonetes comoides*, *Orthotetes crenistria*, etc. Large gasteropods such as *Euomphalus pentangulatus* and *Bellerophon cornuarietis* are common. *Conocardium hibernicum* is a characteristic lamellibranch. Above these beds come the lowest beds with *Productus sub-lævis*, and the Knoll beds of Coplaw, lower part

of Worsaw, etc. Here are the typical C. knolls with numerous brachiopods, the gasteropods mentioned above, but few corals. *Amplexus coralloides* is, however, common, and *Michelinia* sp.

OF N.E. LANCASHIRE.

Above these are well-bedded crinoidal limestones, leading up to the probably C.-S. knolls of Salt Hill, Bellman Park, Worsaw, etc. These beds contain a rich brachiopod fauna, quite distinct, however, from that of Elbolton. Whilst *Productus pustulosus, P. semireticularis, Spirifer striatus,* etc., are quite common, one never finds *P. striatus, P. martini* and other *D.* forms so common in those eastern knolls. A fairly rich coral fauna has lately been discovered in these C.-S. or S. knolls; it has not yet been worked out, however. There is probably an unconformity at this level, and then there succeeds a great thickness of shales with limestones, with few fossils. These would appear to be on the same horizon as the richly fossiliferous beds of Elbolton. Above these shales with limestones come the Pendleside limestones, black limestones with cherts, and with irregular bands of more fossiliferous limestone. The Ravensholme limestone appears to be similar and to contain some of the same fauna as the highest limestone at Cracoe and the limestone of the railway quarry at Rylstone. The Sabden shales succeed these beds, and lead up to the Millstone Grit series. A map was exhibited on which some of these generalisations were shown.

AN OLD BATTLE FOUGHT OVER AGAIN.

According to *The Yorkshire Observer* the discussion on this paper drifted almost entirely on to a rather warm controversy upon the origin of the reef-knolls of that area and of Craven. Professor Fearnsides, premising that he was brought up scientifically at Cambridge, expounded the view held by Dr. Marr, that the knolls were masses caused by a squeezing of the limestone in the course of earth-movements, and the doubling of beds by them being overthrust laterally one upon another.

ORIGIN OF REEF-KNOLLS.

Dr. Vaughan, of Oxford, turned upon the speaker with vigour, and the old battle, which made the Bradford meeting of the British Association memorable, was fought over again in the light of the new work of 'zoning the limestone,' in which Dr. Vaughan has had the lion's share. Dr. Vaughan denied that the origin of the knolls was any longer a matter of speculation. It was a matter of observation. If we examined the limestone in the valley of the Meuse at Dinant, in Belgium, one could see in sections the whole structure of just such a knoll as exists in Yorkshire. There was no sign of squeezing or overthrusting. It was just a thickened mass due to vast accumu-

lations of animal debris in the deeper parts of the clear water. These thickened masses everywhere wherever they were found presented a very remarkable palæontological 'facies.' The assemblage of fossils represented in them was found nowhere else, and it was impossible therefore to conceive that they could have been squeezed up from the horizontal beds which were found wrapped round about them. They could only have been original depositions. Dr. Vaughan spoke with warmth, and the chairman, Professor Grenville Cole, who, apparently, did not enjoy 'a scrap' so much as most Irishmen, had to interpose to bring the discussion back to calmer waters.

THE MIDDLE TEES AND ITS TRIBUTARIES:

Mr. C. B. Fawcett, wrote:—The streams here considered are the middle portion of the Tees and its tributaries from Stainmore to the eastern edge of the Carboniferous rocks of the Pennines. The district which they drain is characterised by the presence of three distinct types of topography, viz.: (1) A wide and comparatively smooth upland surface, sloping gently eastward, but cut off abruptly to the west by the Pennine Scar, with a few hills rising above it; (2) A series of wide, shallow, mature valleys; (3) A series of narrow and youthful valleys, which are for the most part sunk below the floors of the mature valleys. The rocks of the district are almost entirely of Carboniferous age, mainly Lower Carboniferous limestones and shales in the southern half and Upper Carboniferous sandstones and shales in the northern. The complex topography is not primarily due to the rock structure, which is quite simple; but must be ascribed mainly to the work of the streams, influenced in some cases by lines of faulting. Of these streams the middle part of the Tees is the longest and much the largest. It enters Middle Teesdale from the Upper Dale by the Eggleston Gap, with a sharp change in its general direction on doing so. It then flows for about six miles in an almost straight trench at the foot of the fault-line scarp of Marwood Scar, receiving several tributaries from the west and none from the east. At Barnard Castle, the Tees bends eastward, and thence flows, along an arc convex to the south, to its junction with the Langley Beck through a series of alternating gorges and wider terraced valleys. On joining the Langley Beck the river resumes its E.S.E. direction, and two or three miles lower it leaves the Carboniferous rocks.

A STUDY IN RIVER DEVELOPMENT.

This northern west-to-east valley is very similar to the one south of the Tees which is occupied by the River Greta and the Tutta and Clow Becks. Except for the parts of streams in fault-line valleys and in subsequent reaches due to stream capture, there are few subsequent, and still fewer obsequent

streams; hence the river system as a whole is in a comparatively early stage of development. It is, however, the product of at least three distinct cycles of erosion:—First, the comparatively smooth surface of the upland is part of a peneplain. If its valleys were filled up it would be a plain sloping gently eastward with its surface cutting across the rock strata at a small angle. The formation of this peneplain probably occurred during the Tertiary era. Second, the wide shallow mature valleys mark the second cycle. Their shallowness indicates that the change of base level which caused their formation was small; and their relation to the glacial drift and the route of the ice indicates that they had reached their full development before the Ice Age.

TERTIARY ELEVATION.

The elevation which led to their formation probably occurred in the latter part of Tertiary time. The main consequent valleys are all of this type; and the more important of the subsequent valleys are also pre-glacial, though somewhat younger. The Ice Age does not seem to have caused any serious changes in the stream lines of Teesdale; but the extensive river terraces of many of the valleys probably date from the period following the melting of the ice. Third, the deep and narrow gorges in which many of the streams flow are the product of the last cycle of development, which is still in a very youthful stage. Its initiation was due to a post-glacial uplift of the region. The change from the second to the third cycle is readily seen in the longitudinal sections of the streams, most of which show very marked changes of slope. The fall is usually much greater in the lower course than in the middle. A typical tributary valley consists of three clearly marked sections. First, the upper course on the upland with a very slight valley. Second, a broad and shallow valley on the floor of which the stream meanders. Third, a gorge in the bottom of this wide valley in which the stream rushes along over a series of rapids. These three sections of the valley repeat the three types of topography which characterise the district as a whole, and are the results of the three cycles of erosion to which its present form is due.

THE AVONIAN SHORE LINE.

Dr. Arthur Vaughan exhibited a map showing the shift of the western shore line in England and Wales during the Avonian period, in which he gave an idea of the geography of the sea in which the limestones were laid down. Dr. Vaughan suggested that the result of the study of the 'zones' of the limestone proved the existence in early Carboniferous Limestone times of a great land mass, including all Wales and the Wicklow mountains, and a continuous land mass extending through the Lake District, the Isle of Man, and the mountains of County Down.

A channel ran eastward south of the Lakeland mass into Yorkshire, and another southward of the Wales mass. It had become possible to trace in some detail the changes in the geography of these two channels and the differentiation of the northern land mass into islands in the Carboniferous seas.

THE CLASSIFICATION OF LAND FORMS.

Mr. J. D. Falconer read a remarkable paper with the above heading to a joint meeting of the Geographical and Geological Sections, in which he stated it is proposed to set up two classes of land forms, each containing two orders :—Class A, Endogenetic Forms : Order I. Negative Forms ; Order II. Positive Forms. Class B, Exogenetic Forms : Order I. Degradation Forms ; Order II. Aggradation Forms. The two orders of endogenetic forms are then subdivided into four families : Family 1, Forms due to superficial volcanic activity ; 2, Forms due to sub-crustal volcanic activity ; 3, Forms due to radial movements ; 4, Forms due to tangential movements. Similarly the two orders of exogenetic forms are each subdivided into nine families : Family 1, Forms due to the action of the run-off ; and eight other forms due to the action of percolating water, streams and rivers, life, lightning, sun-heat, the atmosphere, frozen water, and the sea. He then sub-divides these nine families into genera, and species or specific forms. This means, for example, that there are quite a number of land forms due to the action of lightning. As was pointed out during the discussion, supposing one is viewing a landscape is it not much better to describe in English exactly what one sees rather than to say that the view represents a certain species of a certain genus of a certain form of a certain order of a certain class of land form ? Even if such a description is accurate, according to the suggested classification, the student must have a classification in his own hands before he can form any idea of the nature of the landscape in question. As Professor Cole pointed out in the discussion, surely it is better to use the English language as tersely, as accurately, and above all as beautifully as we are able (and few writers to-day excel Professor Cole in his charming descriptive language). ' By all means,' said Professor Cole, ' let us use our own language to the best of our ability, as after all it is the power of language which distinguishes man from the foraminifera ! '

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The collection of local books and pamphlets formed by the late J. Horsfall Turner, which includes about five thousand items (a fifth of which refer to Halifax), has been offered to the Halifax Corporation for the nominal sum of £50, and the recommendation of the Library Committee to accept it has been adopted.

YORKSHIRE NATURALISTS AT SALTBURN.

THE Union's visit to Saltburn was a fitting finale to the season's excursions, and favoured as the party were on the first two days with glorious weather, those present spent a most enjoyable time. The attendance scarcely came up to expectations, especially considering the delightful uncertainties of bombardment by ' my glorious fleet ' and Zeppelin raids, in addition to the natural beauties which Saltburn, and the immediate neighbourhood set out as the area of investigation, offers to the lover of the beautiful. More especially is this so seeing that it is twenty eight years since the Union last paid a visit. The sylvan beauties of the ravines are great, while the coast line ever affords a pleasing picture.

The dreadful war is still with us, and no doubt this was partly responsible for the non-attendance of members in great numbers. Nevertheless, if ever the ' inner history of the war ' is written, will there be inscribed upon its pages the names of that brave host of ineligible military members who, regarding the honour of the Union as a form of highest culture, were prepared to face any frightfulness of Germain origin. I wonder !

The Union is once again greatly indebted to Mr. J. J. Burton, F.G.S., for the excellent local arrangements made by him for the success of the excursion.

On Saturday under his guidance, all parties journeyed by train to Skinningrove and revelled in the charms of the Kilton Valley. They also inspected the ruins of the old Norman Castle of Kilton, and the Norman Church at Leverton, wherein is an exceptionally fine and elaborately carved Chancel arch. The return journey was made from Loftus Station.

On the following day the general body of naturalists, under the guidance of Mr. W. H. Thomas, walked along the beach as far as Skinningrove Ironworks ; a delightful walk from a scenic standpoint. On leaving the coast an investigation was made of a charming wooded ravine, the party ultimately emerging to the cliff tops, along which the homeward journey was made, having a floral feast all the way. The geologists were taken by motor by Mr. Burton to Newton Roseberry, from which hamlet they made an ascent of Roseberry Topping, and spent an interesting time in examining the famous plant-bed disclosed after the great landslip some years ago. They afterwards paid a brief visit to the neighbouring Whinstone Workings, ending with afternoon tea at Mr. Burton's residence, and subsequently enjoying the lovely display of roses and rock plants for which his gardens are famous.

On Monday the geological party was again led by Mr. Burton and until the storm made them retrace their steps, spent their time in examining the coast exposures, and the erratics strewn at the base of the lofty cliffs.

The rest of the party trained to Guisborough, and after inspecting the Church, and the Bruce Cenotaph, was led by Mr. T. A. Lofthouse to the Skelton valley, and was soon absorbed in its floral wealth and beauties, the arboreal features being especially magnificent. A thunderstorm of two hours' duration made all seek shelter within one of the coniferous belts, and when the storm clouds had passed the sunshine once again heartened, and the full programme was accomplished.

At the subsequent meeting the President of the Union (Mr. Riley Fortune, F.Z.S.) occupied the chair, and reports upon the work accomplished were given as follows :—Geology, Mr. Burton ; Vertebrate Zoology, Mr. H. B. Booth ; Conchology, Mr. Greevz Fysher ; Lepidoptera, Mr. T. A. Lofthouse ; Coleoptera, Mr. M. L. Thompson ; Fungi, Miss C. A. Cooper ; Flowering Plants, Mr. Wattam. Hearty thanks were accorded Mr. Burton for his services in making the local arrangements, to Earl Zetland, Colonel W. H. A. Wharton and Mr. Burton for permission to visit their estates, to Sir Joseph Walton, M.P., for the privilege of visiting the grounds of Rushpool Hall, and to the guides.—W. E. L. W.

The following reports are to hand :—

Geology.—Mr. J. J. Burton, F.G.S., writes :—The object set before the Geological section was to observe the sequence of strata between the top beds of the Lower Lias and the Moor Grit of the Lower Oolites, the whole of which were exposed within the area marked out for the week-end excursions.

Some little confusion is apt to be experienced unless it is remembered that palæontologists have adopted different divisions between the Upper and Middle and the Middle and Lower Lias from those marked by the Geological Survey ; the latter have made the divisions entirely on lithological grounds, the former on the grouping of representative fossils. It is convenient to follow the Survey and place the *Jamesoni* zone in the Lower Lias, which zone the party had the opportunity of seeing at the base of Huntcliff where the anticline brings it up from below the shore level. The tide being favourable it was easy to examine the section which was found to consist of shales and dogger, the latter apparently ferruginous and very hard. The characteristic ammonite was not observed, but *Belemnite elegans* and *Gryphœa obliquata* were plentiful. The cliffs here are almost vertical and therefore any hammer-work except on the exposed shales and fallen rocks on the beach was impossible, but the lithological sequence of the strata up through the sandy series to the jet rock could be plainly seen and the numerous blocks which had fallen, chiefly from the *margaritatus* zone,, enabled the party to see the nature of the rocks and to observe the masses of fossils crowding them,

indicating that the Liassic sea at the period when the rocks were laid down must have been teeming with life.

The wasting away of the boulder clay in the neighbourhood has left behind much evidence of glacial action. Far-travelled boulders from the Cheviots, from the Lake district and from Upper Teesdale were strewn in the greatest profusion between Saltburn and Huntcliff. Besides igneous rocks from a distance and a remote past, there was a curious assortment of very recent igneous rocks of strictly local origin, the product of Middlesbrough blast-furnaces, much of the slag from which is tipped at sea. These are not unlikely to give rise to some speculation

Photo by] [*H. B. Booth.*

Skinningrove—showing Coast Erosion.

amongst scientific contemporaries in the far off age when that coming artistic New Zealander shall sit in solitude on a broken arch of London Bridge sketching the ruins of St. Pauls !

One of the most striking features of the coast at Saltburn is the large conical mound named Cat Nab. Its origin is fairly evident. The little pre-glacial bay and the two valley streams (Saltburn beck and Skelton beck) which flowed into it were choked with boulder clay. On the ice receding the two streams severally cut there courses in the clay and either entered the sea separately in near proximity or joined seaward of the present coast-line. As they cut deeper a ridge was formed between them. Subsequently this ridge was cut through by the two streams approaching each other and Saltburn beck was captured

by Skelton beck. Both streams have cut deeply through the clay and thus left this isolated mound to tell the story.

Inland in Kilton Valley the sequence was further traced up to the Moor Grit but the luxuriant vegetation and the steep nabs, whilst adding so much to the beauty of the landscape, made it difficult to closely examine many of the exposed sections. It was, however, quite easy to trace the lithological changes in most cases and to study some of them in detail. The abrupt transition from shales to coal and sandstone, and the very irregular bedding, showing the influence of currents, were very noticeable ; as was also the very wavy or sloping line of some of the beds, probably from having been laid down on a shelving bottom or being subjected to some lateral pressure whilst being consolidated.

The plant beds on Roseberry Topping were also visited and the enormous landslip seen. Almost half this well-known conical hill has split away from the remainder and bodily slipped down to a lower level, leaving an extraordinary scene of confusion and mix up. The top consists of a heavy cap of Oolitic Sandstone resting on rotten vegetable beds, which again rest on friable shales, some of which are water-logged. On the sides under the accumulated detritus there is much saturated yellow brick-clay of the consistency of mortar. A fault running through the hill provides a line of weakness. Everything combines to produce an unstable equilibrium. Mining operations were also in progress, but as there was neither crushing of the pillars nor any sign of disturbance in the mine when the slip took place it is contended that such operations were not the cause of the slip.

The removal of the surface covering has exposed many blocks carrying well-marked deeply-cut glacial striæ, some of which are still in situ, the direction of the striæ being N.W. to S.E.

The great Cleveland Whin Dyke which cuts through a shoulder of Roseberry Topping was visited. The quarrying of the dyke for road metal has left a huge gaping chasm with vertical sides, giving it a very weird appearance. The dyke is generally considered to be of Tertiary age. -

(*To be continued*).

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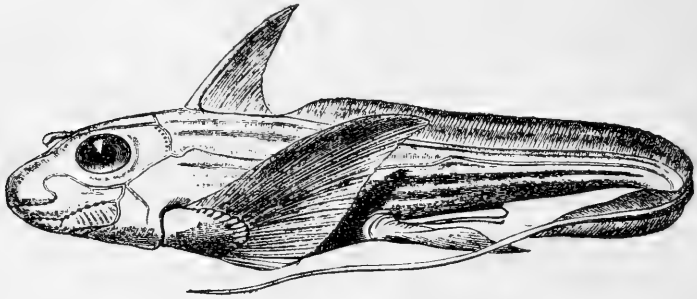
Among the contents of *The New Phytologist*, Vol. XIV., Nos. 6-7, for June and July, we notice ' A Contribution to the Cytology and Life-History of *Zygnema ericetorum* Kutz., Hansg., with some remarks on the "genus" *Zygogonium*,' by G. S. West and C. B. Starkey ; ' Preliminary Observations on the Pollination Mechanism of *Arctotis aspera* Linn., by James Small ; ' The Inter-Relationships of Protista and Primitive Fungi,' by F. Cavers ; and ' A Jurassic Wood from Scotland,' by Ruth Holden. With regard to the last paper we notice reference to specimens being obtained from the ' Lias of Scarborough,' which might be correct if there were Lias at Scarborough.

FIELD NOTES.

FISHES.

Chimæra monstrosa.—A specimen of the ' Rabbit Fish ' or ' King of the Herrings' (*Chimæra monstrosa*), has been added to the Hull Fisheries and Shipping Museum by the kindness of Capt. F. Bridgeman, of the steam trawler ' Drax.' As will be seen from the illustration, the fish is of anomalous structure, possessing a club-like process above the snout, the purpose of which is not clear ; a long, whip-like tail ; a long sharp spine in front of the large back fin, and large clasping processes. It measures about two feet in length, and the species belongs to a very ancient form, which, although common in past geological periods, is now approaching extinction. Of the four surviving



Chimœra monstrosa ♂ (after British Museum Guide to Fishes).

genera, ' Chimera' lives off the European coasts, Japan and the Cape of Good Hope ; ' Callorhynchus ' in the seas of the Southern hemisphere; ' Harrotta ' in the deep Atlantic off North America ; and ' Rhinochimæra ' in deep water off Japan. The specimen figured herewith, taken in the North Sea, is a male ; a female is figured in *Country Life* for July 10th, 1915. Page 72.—T.S.

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BIRDS.

Mistle Thrush falling down Chimney.—From time to time one is surprised—and at times annoyed—by the soot and dirt brought down by birds falling down chimneys. The Starling is the most addicted to this fault ; in fact it is almost an annual event at my house with this species. Other species that I have known to slip down chimneys are House Sparrows, a Chaffinch, a Blue Tit and Jackdaw. On August 18th I was surprised to find a Mistle Thrush in the drawing-room, in a sooty condition, and dead, under a piece of furniture. It had evidently been in the chimney for some days, as the fire-place at the bottom was nearly blocked up with fancy paper. It is a most unlikely species to expect slipping down one's chimney ;

but, in this case, may be partly accounted for by the onslaught the various species of Turdidæ were making on the berries of several Rowan, or Mountain Ash, trees in my garden at the time. It was in the plumage of a bird of the year, and in a very emaciated condition—the latter no doubt due to its imprisonment.—H. B. Booth, Ben Rhydding.

An overlooked occurrence in Yorkshire of the Surf Scoter (*Œdemia perspicillata*).—While hunting through some old records of the Scarborough Philosophical and Archæological Society, I came across the minutes of a meeting held in the Museum on November 16th, 1855, in which it is recorded that a Surf Scoter, which had been shot at Filey, was exhibited by Mr. Roberts. The late Alfred Roberts, who was at that time the Curator of the Scarborough Museum, was well-known in his day as a careful and painstaking observer, and a reliable ornithologist, and records from his lists of birds of the Scarborough district have frequently been quoted in various ornithological works, including 'The Handbook of Yorkshire Vertebrates, 1881'; and 'The Birds of Yorkshire, 1907.' None of these works make any mention of this bird, nor can I find any printed record which appears to refer to it until I turn to Theakston's 'Scarborough Guide,' published in 1865. This contains lists of the flora and fauna of the district, and therein I find the following note:—'*Anas perspicillata*, the Surf Scoter. A rare bird very seldom seen on the Yorkshire coast. One preserved by Mr. Roberts.' It seems probable that this record refers to the specimen exhibited at the Scarborough Museum in 1855. This appears to have been the only Yorkshire occurrence of this species.—W. J. Clarke.

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BRITISH ASSOCIATION NEWS.

Bournemouth will be the meeting place of the Association in 1917.

Dr. E. Marion Delf read a paper on 'The Effect of Temperature on the Permeability of Protoplasm to Water.'

Close upon £1,000 was voted to the various committees by the British Association at Manchester, for the advancement of science.

The members of the British Association made a visit to the Roman Camp at Ribchester, where a meeting was held to open the newly built Roman Museum.

Sir Arthur J. Evans of Oxford will be the President of the British Association at Newcastle next year. He is the eldest son of the late Sir John Evans, and has made important archæological discoveries in Crete and also excavated the Palace of Knossus.

There were 1,439 members attending the British Association namely:—Old Life Members, 242; New Life Members, 19; Old Annual Members, 286; New Annual Members, 116; Associates, 483; Lady Members, 141; Student Members, 144; Foreigners, 8.

Among the interesting reports presented by the British Association we notice those relating to 'The Belmullet Whaling Station'; 'The Age of Stone Circles'; 'Excavations on Roman Sites in Great Britain'; 'Seismological Investigations,' and 'Nomenclator Animalium.'

For obvious reasons the daily press did not give quite the prominence to the reports of the meetings of the British Association this year, as formerly. *The Manchester Guardian* and *The Yorkshire Observer* were in the front with reports and criticisms, and their efforts were much appreciated.

The Committee appointed to investigate the Lake Villages in the neighbourhood of Glastonbury gave a good account of its fifth season's work. Details of many interesting relics are given, classified under the heads of amber, bone, crucibles, baked clay, white metal, bronze, iron, lead and tin, glass beads, Kimeridge shale, antlers, spindle-whorls, flint, querns, stone, pottery, animal and human remains.

Punch says: 'We always look to the British Association to provide sensations for September, and, though this September is in no need of such stimuli, here they are. The President of the Zoological Section describes the earliest forms of life on this planet as "specks or globules of a substance similar in its relations to chromatics." From these—in time—sprang all our great men. Coming over with the Conqueror is no longer a boast of any value. The thing now is to have come in with the globules, so to speak.'

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In *The Entomologist* for August, Mr. W. J. Lucas reviews 'British Neuroptera in 1914.'

Leeds naturalists familiar with 'The Eagle' in a well-known Leeds thoroughfare, will have noticed that 'the bird' has been extinguished by a Yorkshire Naturalists' Union Jack.

Volume IV., part 2 of the *Museum Bulletin* issued by the *National Museum of Science and Art, Dublin,* contains an illustrated account of the domestic animals of Ireland; Notes on Boring Sponges, the Armstrong Collection of Musical Instruments, and Old Pipes.

The Annual Report of the Yorkshire Philosophical Society for 1914 is to hand, and is unusually bulky, being almost entirely occupied by a very valuable and well illustrated paper on 'The Ancient Painted Glass Windows in the Minster and Churches of the City of York,' by Mr. George Benson. In the Report we notice that Mr. Oxley Grabham, the curator, arranged to take a series of tours around the museum and garden, but there was only an average attendance of six.

Memoirs and Proceedings of the Manchester Lit. and Phil. Society, Vol. LIX., pt. 1, have been issued, and contain the following memoirs of interest to our readers:—'The General Morphology of the Stock of *Isoetes lacustris,*' by Prof. Wm. H. Lang; 'Variation in a Carboniferous Brachiopod, *Reticularia lineata* Martin,' by Henry Day, B.Sc.; 'Note of Foggy Days in Manchester,' by William C. Jenkins; 'Note on the Monthly Variation of Sunshine,' by Prof. W. W. Haldane Gee. Prof. Lang makes an interesting comparison between Isoetes and Carboniferous Plants, and Mr. Day gives some remarkable researches in the variation of Carboniferous Brachiopods, based on specimens from Castleton.

We have received a valuable paper on '"Black Neck" or Wilt Disease of Asters,' which is reprinted from *The Annals of Applied Biology,* by Wilfrid Robinson, M.Sc., Lecturer in Economic Botany, Manchester University. From his summary we gather that the tissues of asters attacked by the wilt disease always contain the mycelium of a species of *Phytophthora*; this fungus was isolated and grown in pure culture on various media. The sporangia show most of all the characters described by De Bary for *Phytophthora omnivora,* but after the discharge of zoospores the stalk of the sporangium grows through and produces a second and even a third sporangium within the first. This proliferation has not, as far as is known, been previously described for any species of *Phytopthora.*

THE COUNTY OF THE WHITE ROSE

AN INTRODUCTION TO THE HISTORY AND ANTIQUITIES OF YORKSHIRE

BY

A. C. PRICE, M.A.

Formerly Scholar of Pembroke College, Oxford
Author of "Leeds and its Neighbourhood," etc.

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THIS work has been compiled to assist the large number of persons—residents and visitors—who take interest in Castles, Abbeys, Churches, Battlefields, etc., but from want of a proper historical basis, fail as a rule to understand the allusions and technicalities in the ordinary guide books. It will also help intelligent boys and girls who desire to study the history of their County, on the lines advocated by the Board of Education. The book is the only one of a reasonable size which deals at all adequately with the history of Yorkshire as a whole. Many of the illustrations have been reproduced from photographs by Mr. Godfrey Bingley, Mr. A. C. Parry and Mr. R. Stockdale. To several chapters, notes are appended to guide readers who might wish to extend their studies, and the value of the book is further enhanced by the provision of a very exhaustive Index of names and places.

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THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
THE MUSEUMS, HULL;
AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
TECHNICAL COLLEGE, HUDDERSFIELD.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, F.R.S. F.L.S., GEO. T. PORRITT, F.L.S., F.E.S.,
Prof. P. F. KENDALL, M.Sc., F.G.S., JOHN W. TAYLOR, M.Sc.,
T. H. NELSON, M.Sc., M.B.O.U., RILEY FORTUNE, F.Z.S.

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YORKSHIRE NATURALISTS' UNION.

Vertebrate Zoology Section Annual Meeting.

President: E. W. WADE, Esq., M.B.O.U.

Two Meetings will be held in Room C7 at the Leeds Institute at 3-15 p.m. and 6-30 p.m. respectively, on Saturday, November 20th, 1915.

BUSINESS AT THE AFTERNOON MEETING :—

To consider and pass Sectional Reports for 1915, and to elect Officers for 1916.

To consider and pass the General and Financial Reports of the Yorkshire Wild Birds' Protection Acts Committee for 1915, and to elect Officers and Committee for 1916.

To consider and pass the Report of the Yorkshire Mammals, Amphibians, Reptiles, and Fishes Committee for 1915, and to elect this Committee for 1916.

The following Papers (mostly illustrated by lantern slides or specimens) will be given :—

"Observations on the Sparrow-Hawk and Long-eared Owl," Mr. T. M. Fowler.

"British Reptiles and Amphibians," Mr. Oxley Grabham, M.A.

"Extracts from Field Notes," Mr. W. H. Parkin.

Any Member or Associate of the Yorkshire Naturalists' Union is invited to attend, and to bring notes, specimens, lantern slides, etc., or matters of interest connected with the work of the Section, and to take part in any discussion.

Will officials of Affiliated Societies kindly notify their members ?

A Committee Meeting of the Yorkshire Wild Birds' and Eggs Protection Acts Committee will be held at 2-30 p.m.

All Members of the Committee are requested to attend.

A. HAIGH-LUMBY (*Hon. Sec*),
Nab Drive, Shipley.

Geological Section.

President: J. J. BURTON, Esq., F.G.S.

A Meeting of the Geological Section of the Yorkshire Naturalists' Union will be held in the Leeds University, on Saturday, November 6th, at 3 p.m.

A number of interesting Geological Notes will be read by Professor Kendall and others.

There will also be an exhibition of microscopic sections of Yorkshire Rocks. Arrangements will be made for tea for those who communicate with Mr. A. Gilligan, B.Sc., at the University, before November 4th.

Members and Associates are invited to attend, and to bring exhibits.

C. BRADSHAW, } *Hon. Secs.*
J. HOLMES, }

NOTES AND COMMENTS.

THE MICROLOGIST.*

This magazine has started its third volume after a slight rest, and contains some excellent illustrations. The articles are on 'The Cabbage Root Fly, *Chortophila brassicae* Bouche,' by Mr. J. T. Wadsworth, with notes on its preparation by Mr. A. Flatters. Mr. A. Dinsley writes on 'The Phenomena of Fertilisation and Embryology of the Chick,' and Mr. Flatters

Chick of 11 days' incubation, seen from the right side, nat. size. The feathers are clearly recognisable.

1. Ear.
2. Eye.
3. Upper part of beak, bearing at its end the 'egg tooth.'
4. Wing, the first digit, 4*a*, is seen separate from the rest.
5. Leg (with toes complete).
6. Stalk of allantois and yolk-sack cut across.
7. Cloacal papilla.
8. Tail.
9. Tongue.

adds notes on 'Incubating and the Preparation of Chick-Embryos.' Mr. Robert Pettigrew has a short note on the 'Preparation of Crystals.' By the courtesy of the publishers we are able to reproduce one of the illustrations.

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* Manchester, 23 pages, 1s. 6d.

MESOZOIC PLANTS.*

In this volume Dr. Stopes continues her extraordinarily detailed work among the remains of the Cretaceous plants preserved in the British Museum, and incidentally the collections in the York, Maidstone and other museums are illustrated and described. The first plate figures an unusual fine specimen of *Bennettites allchini*, named after the curator of the museum at Maidstone, who gave facilities for examining it. As illustrating the extraordinary strides recently made in palæo-botany, it may be stated that most of the enormous numbers of specimens referred to in this substantial work are merely fragments of wood, such as are usually found in museums labelled ' fossil wood from Greensand,' etc. A microscopical examination of these specimens has resulted in most important contributions to science on the subject, some indication of the nature of which was given by Dr. Stopes at the British Association meeting at Manchester a little while ago.

PALÆONTOGRAPHICAL SOCIETY.

Volume 68 of this valuable journal, issued for 1914, is probably remarkable from the fact that it is the thinnest and most overdue volume issued by this society. Both facts are doubtless accounted for by the war. The present volume is entirely occupied by an account of ' The Pliocene Mollusca of Great Britain, by F. W. Harmer, being Supplementary to S. V. Wood's Monograph of the Crag Mollusca.' It occupies pages 201 to 302, and plates XXV-XXXII. Manx and Bridlington specimens are illustrated and described. The monograph is useful on account of the revision it makes of some of the so-called ' Crag ' fossils found at Bridlington, in possession of Mr. W. B. Headley, and others, and the illustrations are admirable.

SURVIVAL AND EXTINCTION OF INSECTS.

In concluding his notes on ' Observations on some of the Causes determining the Survival and Extinction of Insects ' in *The Entomologist's Monthly Magazine*, Mr. G. B. Walsh states ' it seems probable that the most potent *human* causes in the destruction of animal life are building operations, close grazing, clean agriculture and forestry, destruction of woodlands, heaths, commons, etc., and destruction of plant life by smoke, dust, and fumes ; the most potent human factor in its preservation is the establishment of preserves where conditions are like those of primæval nature ; and then, besides this, there is apparently

* ' Catalogue of the Mesozoic Plants in the British Museum (Natural History), Cretaceous Flora, Part 2, Lower Greensand (Aptian), Plants of Britain.' By Marie C. Stopes, D.Sc., London : British Museum, 360 pages, 32 plates.

some power of adaptation of at least certain species of insect life which enables them to survive under most unnatural conditions.'

SCILLIES' SEALS.

In *Country Life* for June 12th, July 10th and August 7th, Dr. Francis Heatherly contributes a series of very interesting articles on ' A Sealing Trip to the Scillies ' which will appeal to our readers, especially to those who have followed Mr. Edmund Selous's notes on the same expedition, which have appeared in *The Naturalist*. Dr. Heatherly's articles are illustrated by a wonderful series of photographs of seal life, some of which are taken by himself, and others by Mr. C. J. King. We should like to take this opportunity of congratulating *Country Life* upon its magnificent illustrations, quite a large number of which are of interest to naturalists. There are photographs of giraffes and other large animals in Africa, rare fishes, illustrations of waste lands and other objects, in fact almost every branch of natural history is represented.

INSECTS AT LIGHTHOUSES.*

This is a reprint of a paper, put into pamphlet form, parts of which appeared at frequent intervals in the *Scottish Naturalist* from March 1914, to June 1915, and a very interesting and valuable paper it is. For a number of years Mr. Evans has induced the lighthouse keepers of no fewer than thirteen lighthouses off the Scottish Coast, to secure and send to him such insects of all orders which the lights attracted, as they could collect. From these sources he received some 7,500 specimens, exclusive of over 2,000 gnats. The species represented numbered 241, of which 161 were lepidoptera (2 butterflies and 159 moths) ; 18 were neuroptera and trichoptera ; 40 diptera ; 10 coleoptera ; and 12 of other orders. The great majority were of course insects attracted from the nearest mainland, but there is little doubt that the three Hawk moths attracted (1 *Acherontia atropos* and 2 *Sphinx convolvuli*) were immigrants. Naturally immigration in insects is much better shown by the lighthouses on our south coast than by those so far north. Full lists of the species are given, and serve the very useful purpose of shewing their distribution on the Scottish Coast.

DASYPOLIA TEMPLI.

A remarkable instance of this occurs in the case of *Dasypolia templi*. At one time regarded as almost exclusively a South West Yorkshire moth, lighthouses have proved that it is probably common throughout Britain, or at any rate nearly all around the coast. Common at the Scottish lighthouses, it is

* ' Lepidoptera and other Insects at Scottish Lighthouses.' By William Evans, F.R.S.E.

equally so at the lighthouses off the extreme south of England. On the other hand this report of Mr. Evans is valuable as shewing how rare the hawk moths must be in Scotland, only the three specimens already mentioned being noted. Light has a very strong attraction for these big insects, so much so that at one southern lighthouse, to the writer's knowledge, dozens of the very rare *Deilephila livornica* have been secured by the lighthouse keeper during the past three or four years. Mr. Evans tells us, what of course every collector at street lamps knows, that the preponderance of males over females visiting the light is large. He gives it as 2 or 3 to 1, but we should have expected a far greater proportion, as of the moths which visit inland lights, the comparative number of females is very much smaller. Nor do we agree with Mr. Evans that this signifies 'an actual inherent preponderance of males'; for everyone who breeds lepidoptera in large numbers knows that in most cases the sexes are about equal, but in cases where there is a preponderance at all, it is almost always on the female side. Much might be said on the extraordinary power of flight which some of the geometers and even Tineæ, which we have regarded as weak winged, must have, as proved by these observations; and on many other points brought out by Mr. Evans' interesting investigations.—G.T.P.

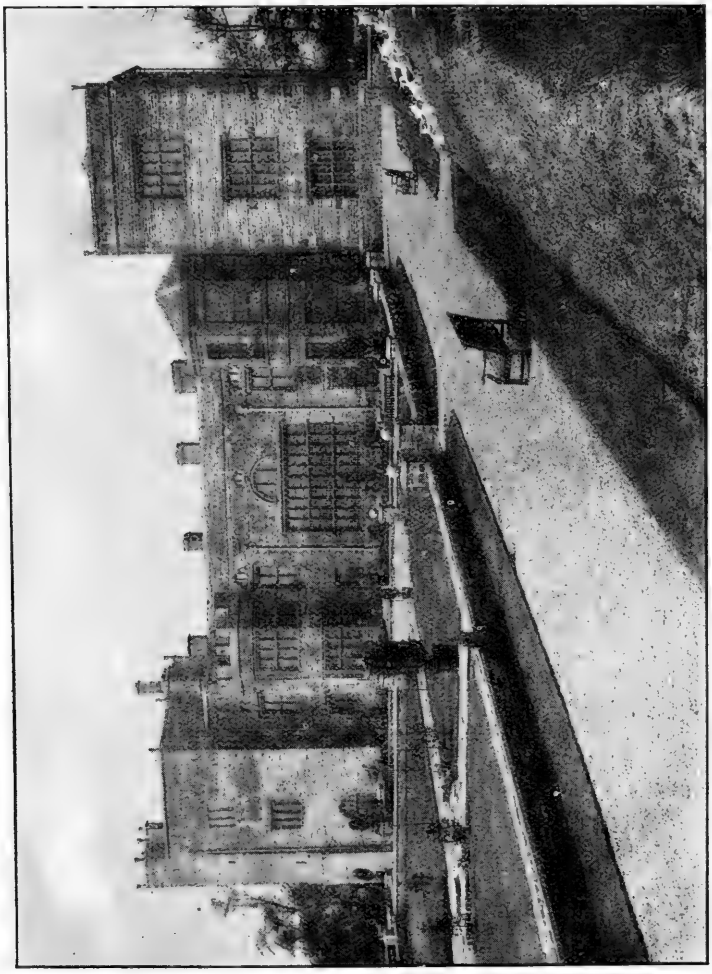
WILBERFORCE MUSEUM, HULL.

On September 28th two valuable additions to Hull's historical museum at Wilberforce House were made available to the public. A very fine carved oak overmantel (circa 1590), supported by thirty-four oak pillars, which was removed to Markington Hall near Harrogate some years ago, was restored to its original position in the main room, having been purchased for £500. £425 of this was presented by Councillor W. H. Cockerline, J.P., the balance being provided by the Board of Education. The overmantel was unveiled by Mrs. Cockerline. On the ground floor a very fine Georgian room, decorated circa 1750, and restored by Messrs. Francis and Arnold Reckitt, was opened by Sir James Reckitt. The Chairman of the Museums Committee gave an account of the history of the building. There is still a fine oak room to be restored; at present the panelling is hidden under numerous coats of paint.

A BRADFORD MUSEUM.

Bolling Hall, near Bradford, was opened as a museum of local antiquities on September 22nd, by Sir Arthur Godwin. About three years ago Mr. George Arthur Paley presented the Hall and nearly 6,000 square yards of land to the people of Bradford. Since then the Corporation has spent about £5,000 in carefully restoring the Hall. Under the direction of Mr. Butler Wood, the City Librarian, the building (which is of various

dates, and in parts is said to be of the fourteenth century), has been arranged as a museum, and apparently contains a fine collection of old furniture, etc. Judging from the outside of



View of Bolling Hall from the South.
(From the Official Handbook).

the building, and from the excellent handbook and catalogue which Mr. Butler Wood has issued, Bradford has at last a museum worthy of the importance of the city. Personally we have not seen the inside as yet, as we spent the afternoon of the opening ceremony outside, listening to the various and numerous speeches and votes of thanks, and the thanks

for the speeches, and the thanks for the votes of thanks. We hope, however, to see the collection soon. From the daily press we gather that the new museum has been very much appreciated by the public. We trust that the Corporation will now turn its attention to the natural history museum. At present it is a disgrace to Bradford.

PRESERVING PLANTS.

In the *Museums Journal* for July, Dr. Fothergill describes a method of preserving plants with their natural colour. Dr. Fothergill employs sheets of absorbent cotton wool, placed in three layers forming two compartments between two 'grids,' which are made of a 'wire mesh-work of half-inch squares with a heavy encircling band.' The necessary pressure is obtained by fastening one or two straps, preferably of webbing, around the grids, and tightening them as required. The flowers to be pressed, having been placed in the grid, are then suspended in front of a fire, or in the sun, when this is sufficiently powerful. The explanation of the success of the method is that the process of drying is so rapid that the pigment is fixed instead of being slowly decomposed.

EARTH MOVEMENTS IN SHEFFIELD.

Professor Wm. G. Fearnsides has kindly favoured us with a copy of his paper on 'Some Effects of Earth Movement on the Coal Measures of the Sheffield District (South Yorkshire and the neighbouring parts of West Yorkshire, Derbyshire and Nottinghamshire),' part 1, recently read to the Institute of Mining Engineers. In this he states, 'it is clear that in recent years the current view among workers in our district has been that 'rock-faults,' 'washes,' and 'wash-outs' are occurrences caused by some sort of stream action during Coal Measures time. Possibly, as Prof. Kendall suggests, two kinds (the contemporaneous-erosion and the tectonic) may exist side by side, but, so far as the writer's own experience has extended, he has visited no single example which he can accept as belonging to the contemporaneous-erosion class. He has not evidence enough to allow him to dogmatise, but he proposes to state a case for the view that the majority of the rock-faults which occur in our own district, as well as the much more frequent examples of rock-rolls which locally come down on to the coal and displace the usual bind or 'clod' in the roof of seams which are subject to rock-faults and wash-outs, have been brought about by horizontal earth-movements due to lateral pressure at a time when the deposition of the measures which contain the coal-seams had been already completed.

THE VASCULUM.

No. 2 of this journal, dated August, has reached us. It contains an article on 'Winter and Summer at Budle,' by Mr.

E. L. Gill; 'A Record of a New British Froghopper (*Homoptera*) from Teasdale' (*sic*), by Mr. R. S. Bagnall; 'Carnivorous Plants,' by J. W. H. Harrison; 'Ballast Plants at Middlesbrough,' by H. Preston; 'Belsay Lake,' by Rev. J. E. Hull; 'A New Flowering Plant from North Yorkshire,' (*Potentilla argentes-venata*, n. sp. from Goathland), by Mr. Harrison; 'Glacial Surface Features,' by Dr. J. A. Smythe; 'The Pied Flycatcher,' by Mr. George Bolam; 'A List of Birds Observed on the Outer Farnes,' by Mr. Edw. Miller; and 'Notes and Records of Animals and Plants,' by various contributors. We notice this list includes several insects new to Yorkshire, and one neuropteron, *Conwentzia pineticola* End., from Cleveland, new to Britain.

A CURIOUS HELIX.

In *The Journal of Conchology* for October, Mr. A. J. Arkell illustrates an interesting *Helix nemoralis* with deformed tentacles. The upper pair are conjunct for half their length, thus forming a fork, like the letter Y. The lower tentacles

are even more abnormal, for where the right tentacle would normally be, there is a kind of irregular reproduction of the upper fork, the right prong being much bigger than the left one; both these prongs possess the characteristics of tentacles. On the other hand, where the left tentacle would normally be, there is a small protuberance, which only resembles a tentacle in that it is somewhat retractile. This is the only feature not shown in the drawing, which is ×3. In all other respects the snail is apparently quite a normal five-banded example. By the kindness of the Editor of the *Journal* we are able to give a reproduction of this illustration.

THE SOUTH EASTERN NATURALIST,

Being the Transactions of the South Eastern Union of Scientific Societies for 1915,* contains an elaborate report of the conference at Brighton this year, and we must congratulate the editor, Dr. Wm. Martin, on the promptness with which

*cxii. + 100 pages, 3s. 6d. net.

the volume has appeared. The presidential address of Dr. J. S. Haldane refers to 'The Place of Biology in Human Knowledge and Endeavour,' and the volume includes many interesting papers read at the Conference. These deal with 'Regional Survey and Local Natural History Societies,' by C. C. Fagg; 'Terrestrial and Fluviatile Shellfish,' by Hugh Findon; 'Brighton's Lost River,' by E. A. Martin; 'Study of Place-Names, with Illustrations from the South-East of England,' by Arthur Bonner; 'The Connection of Kew with the History of Botany,' Prof. G. S. Boulger; 'Sussex Orchids,' by E. J. Bedford; and 'The Fly Peril and its Cure,' by G. Hurlstone Hardy. The report is well illustrated.

THE ESSEX NATURALIST.

After a lapse of some time, what is described as parts 1-6 of volume XVIII. of *The Essex Naturalist* (88 pp.), has appeared. The contents are varied, but among them we notice 'Illustrations of Mycetozoa, dedicated to Samuel Dale, M.D., in Micheli's "Nova Plantarum Genera," 1719,' by Miss Gulielma Lister; 'Note on the Occurrence of Chalky Boulder Clay at Chingford,' by P. G. Thompson; 'The Dating of Early Human Remains,' by S. H. Warren; 'The Chigwell Row Medicinal Springs: a Late 18th century account of them, by (?) the Rev. Dr. Wm. Martin,' edited by Miller Christy; 'Notes on the Low Level Gravels of the River Lea and their Palæolithic Implements,' and 'Notes on a Fossiliferous Exposure of London-Clay at Chingford, Essex,' by A. Wrigley; 'Tree Trunk Water Pipes,' by T. V. Holmes; and 'The Slipper Limpet in Essex.'

MR. C. CROSSLAND'S COLLECTION

A collection of mosses has recently been presented to the Halifax Museums Committee by Mr. Charles Crossland, and deposited in the botany room at the museum. They are from Mr. Crossland's Moss Herbarium, but confined solely to specimens gathered within the Parish of Halifax, mostly during the last 25 years. They represent about 150 species and varieties, but there are over 400 separate packets in the collection, stored in four suitable cardboard boxes, and all scientifically arranged and named. Box No. 1 contains the Bog or Peat mosses, called also pack-mosses, a group technically known as Sphagnaceae, a class of mosses which grow only in wet places on moorlands or on other swampy, waste ground. This comprises a fairly complete set of the bog-mosses recorded for the Halifax district, and include specimens gathered on Wadsworth, Stansfield, Erringden, Norland, Sowerby, Saltonstall, Ogden, and other local moors. They are classed according to Dr. Warnstorf's 'European Sphagnaceæ,' a reprint of a translation of which from the *Journal of Botany*, 1900, accompanies the mosses. Boxes 2, 3, and 4 contain the ordinary mosses to

be found, among other places, in woodlands, in courses and on banks of clear streams and small water runs, in well troughs, on moist shady walls, dripping rocks, moorland ground, tree trunks, poor starved fields, waysides, garden walks, poor lawns, greenhouses, etc.

OF HALIFAX MOSSES.

There are specimens gathered from all the above habitats. These are named and arranged according to the system adopted by the Rev. H. N. Dixon, M.A., in his 'Students' Handbook of British Mosses,' 1896. In addition to the technical name of the moss, each packet bears the date when the specimen was gathered, the locality where found, and name or initials of finder. It is noticeable that many were gathered in the Hebden Bridge district by James Needham, and by Mr. J. T. Aspin in other local districts. An extra box is set apart for the reception of the Halifax mosses found in Leyland's Herbarium of British Plants. This herbarium was formed by Roberts Leyland for the museum founded by the Halifax Literary and Philosophical Society at Harrison Road about 1830, of which he was one of the original members, a trustee, and curator of the Museum until his death in 1847. As is well-known, the society presented the collections in their museum to the town in 1896, and they have since been housed at Belle Vue.

LEYLAND'S MOSSES.

When, in 1901, Mr. Crossland went through the moss portion in search of Halifax specimens to include with his own in compiling the moss section of 'The Flora of Halifax' (by Crump and Crossland), he kept Leyland's specimens separate, so as to render them of easier reference to future local students. The collection was found to contain about 100 specimens collected within the Parish, bearing dates between 1819 and 1846, but mostly during the years 1833 to 1837. Where necessary, modern names were added, and all were numbered according to Dixon's 'Handbook' Catalogue, a marked copy of which is deposited with the mosses. In addition to this, Mr. Crossland has presented to the Public Library a copy of 'The Flora of Halifax,' with the moss portion (pp. 145-203) marked, indicating the specimens in each collection.

THE USE OF FOSSIL FISHES IN STRATIGRAPHICAL GEOLOGY.

From Dr. A. Smith Woodward of the British Museum we have received a copy of his presidential address dealing with the above subject. In this he points out that it is clear from the stratigraphical distribution of the Palæozoic and Mesozoic fishes, after due allowance has been made for imperfections in the record, their order of succession corresponds with their zoological grade as determined by embryology—a fact first

noted in general terms by Louis Agassiz. The dominant Silurian fishes seem to represent a stage before the interior visceral arches had become completely differentiated into jaws, and before paired fins had been developed. The subsequent successive stages are marked by (1) the acquisition of normal jaws and paired fins ; (2) the addition of a bony exo-skeleton ; (3) the supersession of paddles by purely dermal expansions as fins ; (4) the abbreviation of the primitive tail and the correlation of the dermal rays with the endoskeletal supports in the dorsal and anal fins ; and (5) the completion of the ossification of the endoskeleton. The directions of specialization in each of these grades, at successive periods, are essentially similar, but at every advance more variation becomes possible, and the diversity among Tertiary and recent teleostean fishes is very much greater than in the groups of any earlier period. Whether these advances have taken place simultaneously in different parts of the world, or whether they have occurred locally and then spread by migration, is still a difficult question. This and kindred problems can only be discussed by comparing the palæontology of the fishes with that of other animals which have been similarly studied.

GRIME'S GRAVES.

We have received an admirable ' Report on the Excavations at Grime's Graves, Weeting, Norfolk,' March-May, 1914, 255 pp., price 5s. net. A committee was formed for the purpose of systematic excavations of the remarkable structures known as Grime's Graves, and whatever may be one's views as to the origin of these extraordinary structures, there can be no question that the present report supplies a mass of facts which should be carefully studied by the serious student. The Society has also illustrated the report by thirty plates and nearly a hundred illustrations in the text. There is a discussion as to the age of the pits. We are permitted to reproduce a remarkable photograph of an extraordinary number of picks of red deer antlers (erroneously called ' horns ') found during the excavations. Many of the subscribing institutions now have examples of these in their collections.

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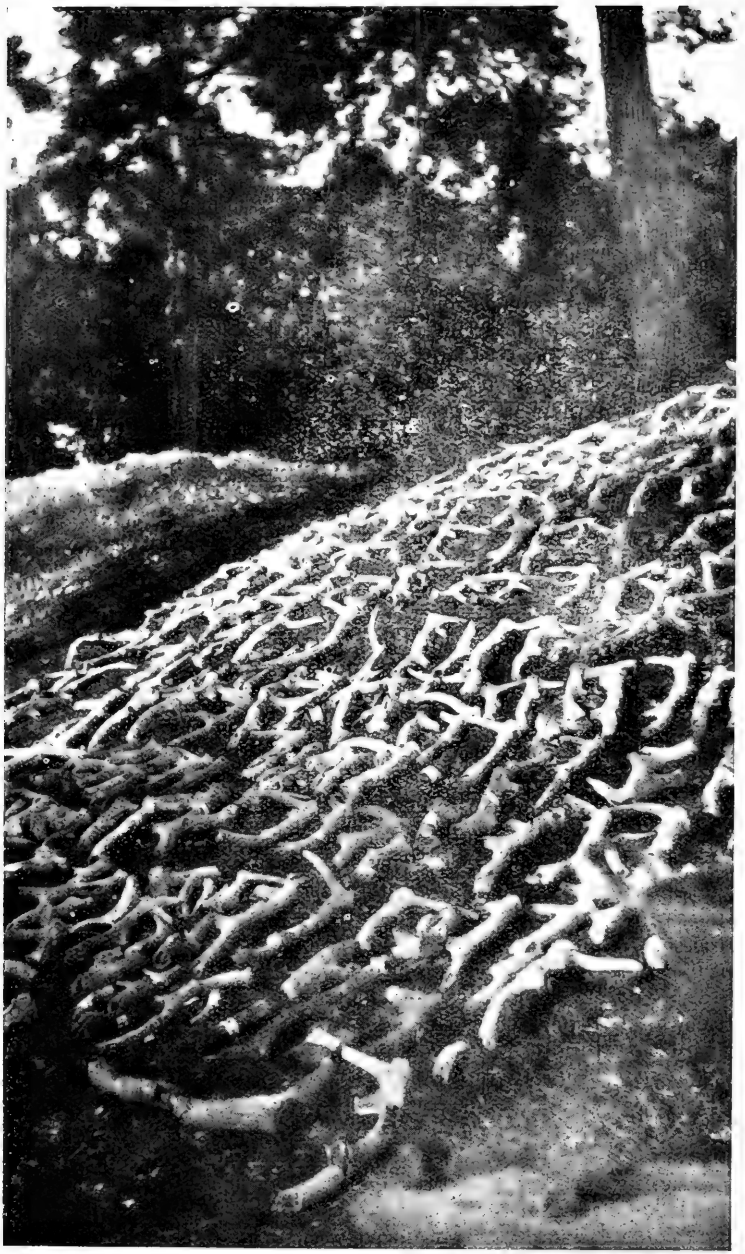
BRITISH ASSOCIATION NOTES.

FAUNA OF THE LIMESTONE BEDS

Mr. Henry Day put forward some observations on a collection of some three hundred species of Carboniferous Limestone fossils from the localities Treak Cliff and Peakshill, Castleton, and embracing about one hundred species of brachiopods and corals. The beds at both places may be referred to the ' brachiopod beds ' of Sibly (' Q.J.G.S. 1908 '), and what are allocated by him to sub-zone D^2—the Lonsdalia sub-zone. The present



Deer-antler picks from Grime's Graves.

list of species presents some features of considerable interest bearing on the value of certain types as zonal indices. Reference is made to Vaughan's paper on the Bristol area, where it is indicated that amongst the brachiopod groups confined to the Tournaisian in that area are the following: *Productus cf. martini*; *Leptena analoga*; *Schizophoria resupinata*; *Rhipidomella aff. michelini*; *Spiriferina octoplicata*; *Syringothyris cuspidata*. Two of these, it is noted, *Spriferina octoplicata* and *Schizophoria resupinata*, are sub-zonal indices, and each with its maximum in its sub-zone. The list of Castleton forms from well up in D, now presented, includes all the above-mentioned brachiopod groups. *Syringothyris cuspidata* and *Spiriferina octoplicata* are fairly abundant at both Treak Cliff and Peakshill, *Schizophoria resupinata* is extremely abundant at both places, *Leptena analoga* is abundant whilst *Productus cf. martini* and *Rhipidomella michelini* are rare.

AT TREAK CLIFF AND PEAKSHILL, CASTLETON, DERBYSHIRE.

Passing to the coral fauna, the genus Zaphrentis appears in the Castleton list, i.e., one of the two genera of corals confined to the Tournaisian in the Bristol area and not extending into the Viséan. The genus, though not very abundant, is represented by several species. In addition, the genera Michelinia and Amplexus, characteristic of the Upper Tournaisian of Bristol, but possibly extending into the base of the Viséan are cited in the Castleton list, *Michelinia glomerata* being fairly aboundant at Peakshill, and *Amplexus coralloides* is found at Treak Cliff, but is extremely rare.

ZONAL DETERMINATION.

These facts lead to a consideration as to how far the types mentioned are of value in zonal determinations. If any one of them, as recorded from Castleton, be regarded as representing exactly the same form as that recorded from the Bristol area, then its value as one of a number of index fossils of a zone becomes negligible. Examples are cited in the cases of *Spiriferina octoplicata* and *Schizophoria resupinata*. If the Castleton forms of D^2 horizon agree in identity with the Bristol types of K^2 and Z^2 respectively, then these two types become worthless as sub-zonal indices. It was pointed out that, even allowing of the rather unlikely possibility that in all the cases cited the Castleton specimens represented mutational forms of the Bristol species, the real difficulty as to their zonal value is not overcome, since the line of demarcation between mutations is more or less arbitrary and there is still a considerable field of discussion as to what constitutes a 'mutation.' It appears probable that any system of zonal indices can be of local value only, as for example in the application of the Bristol zonal indices within the Bristol area, and cannot be of any general application.

THE ISOLATION OF THE DIRECTIONS-IMAGE

Dr. J. W. Evans discussed the different methods by which the interference figures of a small mineral in a rock-slice may be kept distinct from those of adjoining minerals. He recommended two. In one, which he believes to be new, a diaphragm with a small aperture is placed below the condenser, which is lowered till the image of the aperture appears in focus on the rock-slice. In some microscopes the iris diaphragm provided for the Becke method of determining the refractive index may be employed. In others it is too near the condenser. The aperture should be sufficiently large to illuminate the maximum area of the mineral under investigation, but no portion of the others. The directions-image may then be observed in any of the usual ways. Unless the condenser and diaphragm revolve with the stage the aperture must be very carefully centred with the axis of rotation.

OF A MINERAL IN A ROCK-SLICE.

The other method was proposed by Becke in 1895, but is very little known. The diaphragm is placed in the focus of the eye-piece so as to shut out all except the mineral selected. The Becke lens, or system of lenses resembling an eye-piece, is placed above the eye-piece, when the directions-image of the mineral will be seen without any admixture of light from its neighbours. This method has the advantage that the diaphragm is less highly magnified at the time of adjustment. When a rotating stage is employed, a very accurate centring of the nose-piece of the microscope is required, so that the coincidence of the object with the aperture may be maintained. The common practice of placing a diaphragm for this purpose immediately below the Bertrand lens rests on no scientific basis, and is not effective in shutting out the light of minerals other than that which is being studied.

NORWEGIAN GRANITE.

A rather interesting example of the value of the interchange of ideas on the heterogeneous mass of papers read at a meeting of the British Association arose in the Geological Section. There Professor R. C. Wallace described some of the salt pans of Manitoba, in north-west Canada, and showed that the salt had a peculiar disintegrating action upon certain volcanic rocks which were found as boulders in their neighbourhood. Professor Fearnsides imparted a topical interest by connecting the observations with a phase of the Tariff Reform agitation of a few years ago. At one time a great outcry was made against the importation of Norwegian granite for the building of Government dock walls. During this controversy an engineer declared that even if the price was equal, the Norwegian granite was to be preferred as the more durable. Professor Fearnsides

was asked to advise whether there was any geological basis for such an opinion, and he frankly told the section that he reported that, so far as he knew, there was no warrant for the opinion at all. He saw now from Professor Wallace's observations on the Manitoba boulders that it was quite possible and probable that such a difference might exist in favour of the Norwegian granite. The Canadian speaker had shown that the durability of the granite depended upon whether it contained soda or potash in its felspar. The potash felspars were strongly acted upon by salt water—not by the salt solution directly, but by an acid solution which arose indirectly from the brine. The soda felspars were not readily affected. It remains to be proved whether the Norwegian granite contains felspars containing potash or soda, if they contain soda, then it is quite probable that the rule-of-thumb experience of the engineers was right.

THE HETERANGIUMS OF THE BRITISH COAL MEASURES.

Dr. D. H. Scott stated that Williamson, in his published papers, only recognised two British species of Heterangium, *H. Grievii* and *H. tiliæoïdes*. Under the former name he included not only the Lower Carboniferous plant from Burntisland, on which the species was founded, but also certain Coal Measure forms from Dulesgate. In the joint work by Williamson and the present author the same nomenclature was adopted, but a second form from Dulesgate was also described under the provisional name *H. cylindricum*. *H. tiliæoïdes*, a Coal Measure species from Halifax, remarkable for the great development and perfect preservation of the phloem, has been kept distinct ever since its first discovery in 1886. The enormous difference of age between the Burntisland and the Dulesgate plants rendered their specific identity highly improbable, and the latter has been separated under the name *H. Lomaxii*, originally suggested by Williamson himself, after the name of the discoverer, though not published.

HETERANGIUM LOMAXII.

H. Lomaxii is characterised by the great distinctness of the primary xylem-strands, by their nearly exarch structure, with little primary centrifugal wood, by the abundant secretory sacs of the stele and by the rather scattered leaves. In the Dulesgate material, several forms of Heterangium stem have been found in association ; it is unlikely that they are specifically distinct—they more probably represent axes of different orders. The provisional species *H. cylindricum* differs in no important respect from *H. Lomaxii*, to which it should be reduced. A very fine Heterangium from Shore was discovered by Mr. Lomax and his son in 1912. It is of large size, at least 17 mm. in diameter, though without secondary growth.

The plant was originally compared with the so-called *H. cylindricum*, but is at least as close to *H. tiliæoïdes*. The feature which at first seemed to be most striking is the fact that four distinct leaf-trace bundles enter the base of the leaf, each of them dividing into two in the petiole. This is certainly the best example yet found of a polydesmic petiole in Heterangium, and shows an interesting approach to the Medulloseæ in this respect. We may also compare Dr. Gordon's new genus Rhetinangium.

POLYDESMIC HETERANGIUM.

However, there is reason to believe that most of the British Coal Measure Heterangiums were polydesmic. In *H. tiliæoïdes* there are four distinct bundles in the petiole, and the same was the case in *H. Lomaxii*. In all these plants two bundles start from the stele to form the leaf-trace, dividing into four, at least in some cases, before entering the leaf-base. Only in a very small stem from Dulesgate (not associated with *H. Lomaxii*) did a single bundle leave the stele (as in the Burntisland species) dividing into two on its outward course. This little stem has nothing to connect it with any other form and may be distinguished as *H. minimum*. *H. tiliæoïdes* is maintained as a distinct species, mainly on the ground of its highly developed phloem with dilated medullary rays. In the behaviour of the leaf-traces it comes very near the Shore plant, which may, for the present at least, be kept distinct under the name *H. shorense*.

FOSSIL FUNGI AND FOSSIL BACTERIA.

Dr. D. Ellis reported that an investigation of the ferruginous and fossiliferous rocks of Great Britain showed that some of the organic fragments in the ferruginous rocks had been in a state of putrefaction when engulfed. A study was made of the micro-organisms which were responsible for this putrefaction. A fossil fungus was found in the Frodingham Ironstone of Lincolnshire (Lower Lias). To this organism the name *Phycomycites Frodinghamii* has been given. *Characteristics.*—Hyphæ of two dimensions, namely 2 μ and $3\frac{1}{2}$ μ respectively. The two sizes of hyphæ were found in organic connection. There were no traces of transverse walls. In addition to the ordinary alternate branching whorls of hyphæ arising from the same level were frequently observed. In many places the threads showed thickening cushions. Some of these were apparently in association with the formation of branches and were of a supporting nature ; others, however, had no apparent significance. Some of the hyphæ had terminal dilatations of a sporangial nature, as in a few cases spore-like bodies were enclosed in them. The sporangia measured about 24 μ ($\frac{1}{40}$ mm.) and were roughly spherical. The spores were 10 μ in diameter.

Probably each sporangium normally enclosed four spores. The fungus, unlike all modern fungi, had a power of attraction for iron-compounds, and in all cases its hyphæ were covered with a varying quantity of ferric hydroxide. Other examples from Scotland etc., were also described.

THE APTIAN FLORA OF BRITAIN.

Dr. Marie C. Stopes stated the so-called 'Lower Greensand' deposits of this country are of Aptian age, and represent the upper division of the *Eocretaceous* according to the recent classification by Haug. From these deposits the plants hitherto known—notably *Bennettites Gibsonianus* Will. and *Cupressinoxylon vectense* Barber—have been so few that it has been impossible to speak of a Lower Greensand 'flora.' It has been generally assumed that both the climate, and the animals and plants then living were the same as those of the preceding Wealden. As a result of recent work the author has now brought together a flora consisting of 45 species, containing 9 Cycadophyta, 27 Conifers, and 5 Angiosperms. Most of these are represented by petrifactions of the cellular anatomy, and many are very beautifully preserved.

EARLY ANGIOSPERMS AND THEIR CONTEMPORARIES.

Some of the forms have structures of botanical interest, while others are of value as indicators of the climate of the epoch, of which nothing was previously known. It is interesting to find evidence of a change of climatic conditions about this time, so that the cooler weather and well-marked seasons of the Lower Greensand afford a great contrast to the 'tropical climate' of the Wealden of Southern England. Among the plants of botanical interest may be mentioned a new genus of *Cycadophyta* with curious wood structure; a new species of *Protopiceoxylon*; the leaf anatomy of a true *Sequoia*; several species of *Pityoxylon* with well-developed ray-tracheids; and several Dicotyledons. It should be remembered that these are all contemporaneous with the type species of *Bennettites*. The Angiosperms are the oldest found in Northern Europe, and the oldest of which the anatomy is known. They are all woody; two of them, at least, must have had tall timber trunks. In some of them the minute details are particularly beautifully petrified, and show a very high degree of organisation. Like the Conifers, they show seasonal growth. They represent a dry—possibly fairly high—land vegetation.

BOYS AND THE WAR.

What do our children really think of the war? Dr. Kimmins endeavoured to elucidate this question in a paper read before the Association. In an essay competition, in which 1,511 boys and 1,570 girls in the senior departments took part, the fact emerging most clearly was the bellicose attitude of the girls

of 10, the wave of depression at 11, and the establishment of normal interest at 12 years of age. The boys, on the other hand, became more warlike at 11, and though a period of slight depression followed upon this, it was much less marked than in the case of the girls. From the age of 11 onwards great anxiety was felt with regard to the price of food. Some examples of unconscious humour are given. A little girl, aged 11, wrote: 'The origin of the war is this, that when the German Emperor was at Windsor he insulted Queen Victoria, and so King Edward smacked him round the face. The German Emperor said, "I'll be avenged," and hence the war.' A boy of 12 wrote: 'The advantage of the war is that women have learned to knit.' Another wrote: 'The main disadvantage of the war is that girls must remain old maids because there will not be any men left.' These illustrations rather lend point to the contention of Mr. Leslie Scott that the war booklets of the French Government might be imitated with profit in English schools.

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The Museums Journal for September contains a report of an interesting discussion on 'Museums and the War.'

The National Museum of Wales has issued a large 'Descriptive Handbook to the Relief Model of Wales' by W. E. Whitehouse, and a 'Catalogue of an Exhibition of Welsh Topographical Prints' by I. J. Williams.

The Museums Journal for October contains a report of the discussion on 'Museums in relation to Education' which was opened at the conference of the Museums Association by Prof. J. A. Green of Sheffield.

The *Reports of the Librarian, Parks Superintendent and Museum Curator of the Borough of Stockport* have been issued. The last, Mr. Hewitt's fourteenth annual report, includes particulars of additions made during the year.

We notice that the *Catalogue of the Museum of Fisheries and Shipping, Pickering Park, Hull,* has reached its fourth edition, and the new issue contains particulars of many valuable additions. The catalogue contains 52 pages, is well illustrated, and is sold at 1d.

The Sixty-Sixth Annual Report of the *Ipswich Museum,* etc., contains illustrations of a Roman Amphora, Deer Antler Picks from Grimes Graves, and Rostro-Carinate Implements, these being among many interesting additions to the collections made during the year.

Hull Museum Publication, No. 103, being the Quarterly Record of Additions, No. 50, has been issued. It contains a number of reproductions of local bygone relics and other objects added during the three months covered by the record. It is sold at one penny.

The Museums Journal for August contains the Presidential Address of Mr. E. Rimbault Dibdin of the Walker Art Gallery, Liverpool, which deals with the question of the management of Art Galleries under war conditions. There is also an excellent portrait of Mr. Dibdin.

The Report of the Warrington Museum Committee for 1915 contains a list of numerous additions during the year, with an illustration of a very fine Equestrian Aquamanile of the 14th century, which has been recently presented. During the year Mr. Dunlop has prepared and displayed a series of specimens to illustrate the characters and forms of the mollusca.

OBSERVATIONS ON THE GREY SEAL.

EDMUND SELOUS.

(*Continued from page 284*).

At length the mother Seal came out on the rocks, but the young one was unable to get up into the proper juxtaposition, and, after a little while, she came off into the sea again. There was now another lengthy interval, and, during a part of the time, the male Seal was often in the near neighbourhood of the mother and calf, though never quite close to them. Finally the mother went up on the rocks again, either at the same place or very near it, and, the tide being now a good deal higher, her calf was able to follow her and suckling took place. It was, however, brought to a somewhat premature conclusion through a wave washing over the rock, and drawing the young Seal down with it as it receded. The mother, whose bulk was not so easily shifted, remained for a little on the rock and seemed waiting for the young one to come back. This however, it did not do, nor did I see it again till sometime afterwards. Now, however, appeared the male, and, swimming right up to the rock on which the female was lying, he raised his head a little up the face of it and seemed asking her to come off, as in a moment or two indeed, she did, when they swam away together —the usual varied degree of proximity that is to say. A little before she did so, at the time, more or less, of the male's close arrival, a cry, very like the moaning of the calf to be fed, arose, and was attributed by both King and Heatherley (who were here joint watchers with me) to the female Seal. I certainly did not see the calf during the time of its utterance, nor had I since the backwash of the wave took it off. Moreover it had been pretty well fed before this occurred. The above incident, together with what else evidential on the subject I have seen hitherto, seems to point to these Seals being monogamous and also very affectionate in their conjugal relations. Heatherley, however, formed the opinion that the male Seal saw us and gave the alarm to his mate. In this I do not concur. I saw no evidence of alarm on his part and the whole of his conduct is easily accounted for by supposing him impatient for the company of the female. The cry was not his, but hers. It was, I think, of the nature of a greeting, and her going off, after uttering it, was natural and much after the manner of her usual departure after suckling the calf. Even without the inducement of the male, she had so nearly finished doing this before the slight contretemps mentioned, that I feel sure, from previous experience, she would not have waited long for the quite problematical return of a well-fed child. Again, both the

distance and the only very slight elevation of our heads above the irregular line of the rocks, behind which we crouched, make it, to my mind, highly improbable that either of the Seals should have sighted us, nor would they have been likely to show active alarm, even if they had. I had noticed several times that if these Seals saw anyone sufficiently close, or obstrusively outstanding, to make them apprehensive, they snapped themselves under water, so to speak, with a splash, but otherwise went down quite quietly, one may say lazily. This indication was never given by the male Seal as he swam up, nor by either of the pair as they swam away; in each case, it seemed to me, quite at ease. Neither in the above incident, therefore, nor on any other occasion was I able to find any evidence of the male Grey Seal's playing the part of sentinel to his family, as Heatherley thought it did. There was nothing that I saw, where this question might seem to arise, that was not amply accounted for by ordinary conjugal affection. The calf was often left for hours—once for ten hours—on the rocks, without either of the parents coming to that part of the shore—indeed, they were not to be seen anywhere—and the male was often equally absent whilst the suckling was taking place. In the case of the Common Seal, I have more than once demonstrated the fact that any one of a group on the rocks that saw me would drop into the sea, leaving the others still lying there. Where, then, was the sentinel? and can it be supposed (as it has been suggested) that any animal—even a Seal—exercising discretion and judgment, would sometimes post sentinels and sometimes not?

Whilst the suckling was proceeding, Heatherley drew my attention to a rounded boss on the upper part of the body of the *alma mater*, a little below the chest, on the right side, which was the one uppermost and most exposed to view. He suggested that this might be a rudimentary teat. As to the physiological possibility, or otherwise, of this, I am not competent to express an opinion, but the supposition certainly seems to give a new significance to the endeavours, during the feeding time, of the calf to move upwards towards the head of the mother, and of the latter's flicking of it down, again, to the right place, by quickly repeated gentle blows of that flapper at liberty—the upper one, that is to say, as she lies. On two of these occasions the calf was thus induced to continue sucking, his mouth being once actually guided to the teat, whilst on the third, when he persisted, the mother went off.

I was left alone about 5 p.m. to spend the night in the shed, which I did, keeping absolutely quiet and closing up every aperture, even to the small ventilation holes, before lighting a candle to read by. I cannot, of course, say whether any seal, young or old, came out upon the rocks, in the night, whilst I

slept, but I do not think so, since none lay there this morning—(OCTOBER 19TH now)—though one, a full-grown female, swam about for sometime in one of the little inlets of the sea running up to the shed. As the tide sank, it afterwards disappeared—not landing, I believe—and has not again returned, nor has any grown Seal visited this whilom resort of theirs, all day long, so far as I have been able to observe. In fact, it is very evident that the Seals have withdrawn from this cove, as from a populous resort, such is their appreciation of the upright human form, that

> '. . . far nobler shape, erect and tall,
> Godlike erect, in native honour clad,
> In naked majesty——"

But the passage can no longer be closely applied—perhaps its the clothes they object to. Shortly after the tide had begun to go out, however, I saw a young Seal lying approximately where the one that was fed yesterday had been, and, no doubt, the same animal. It was not however, before it was more than three quarters high tide again that the parent Seal appeared and made a long and what seemed rather a precipitious climb, to get to her infant, which did not, this time, come to meet her. As she now, in suckling it, lay on that side which presented her back to me, the latter had to go round, and so was invisible to me all the while. The time taken must, I think, have been fully a quarter of an hour, and then the old Seal came down by a still longer way, making, at the last, a long sliding drop into the water, over some steeply sloping rocks that overhung it. The male soon appeared, but there were no connubialities, and, after awhile, he retired again. The female kept about, off the shore, as if waiting for her calf, which lay most immovably a little higher up on the rocks than where he had been fed. The tide rose and rose, and the spray began slightly to touch him, but he took little or no notice, when, all at once—as a surprise, I should imagine, but perhaps it was in his previous experience—several big waves rushed,* one after another, up the rock and burst in foam and thunder all over him. The young Seal was swept right away into the sea—invisibly, however, so lost was he in the white seething caldron—and it was not till a considerable while afterwards that I saw him, again, for certain, swimming off the shore, and seeming none the worse for his accident, if it can be considered as one. The sea now rushed foaming over the rocks on which his mother had just fed him, making a broad strait (in proportion with

* Three or four, I think—those 'three kicks of the sea,' which shore folk and fishermen speak of; and rightly, in a rough way, to go by my own experience here. In another such instance I should certainly have been washed off the rocks myself had I not been warned in time.

the small scale of things here) between two tidally sundered rocky islets. In this turmoil I soon again lost him, nor did I see him any more whilst I stayed. The female, however, continued, for a long while, to swim or float perpendicularly amidst the swirling waters, making of them, through her reposeful luxurious motions,

'her thrice-driven bed of down.'

I think there must have been an interval of at least ten hours between when I first saw the young Seal lying on the rocks and the time at which it was suckled. As my presence was unsuspected during the whole of the time, and there was no one else on the island, this must represent a natural period. Thus a great difference is observable between the frequency with which quite young calves and older ones are suckled. I put down the one in question as some ten days or a fortnight old, and since it was in all probability the larger of the two that had lain near the shed, it can hardly I think have been older—the first figure perhaps is more likely.

I noticed (as I had done yesterday, but now more plainly), whilst the mother Seal lay with her back to me, that she had, a little to one side of the median line, and about half way down, a long deep-looking wound.* It was also wide—indeed a very ugly trench indeed—at the least a foot long, but I should say nearer eighteen inches. It could hardly, I believe, have been worse had it been made by the claw of a Tiger. Another 24 hours on the island gave me nothing further to record.

As the above notes represent original observation on the habits of a quite well-known species, I have not added to their length by saying anything about its classification, Latin name, size, weight, 'pelage,' etc., all which are to be found in the ordinary standard compilations. I may remark, however, that the young Seals are white or nearly so (that at least was my experience) and that the splendid mottled, or rather, blotched, belly of the grown ones, as well as the beautiful appearance which it presents under water, never seems to have attracted the attention, much less roused the interest of anybody, at least of any naturalist. Those who care about the actual doings of animals will find a record of some more of those of this Seal (as well as the Common one) in my 'The Bird Watcher in the Shetlands,' though unhappily, and to the scorn of critics, I have there referred to the first under an obsolete Latin name. As information thus clouded may not be worth attention, I will point out here, where the misfortune has been

* I think I must have entered it in my notes, but seem to have forgotten to copy it out, that this Seal had a good deal of blood about her head. In some way or other she had evidently been hurt, and this may have had to do with her apparent neglect to suckle her calf.

avoided, that no male Grey Seal ever, to my knowledge, landed on this island or lay on any outlying rock of it, as was the daily practice of one which I watched in the Shetlands, earlier in the year. Nor, with one exception, for which there may have been a special reason, did I see a female land upon it except for the purpose of suckling the young. The males, or both they and the females, may have their habitual resting-rocks elsewhere, but possibly the difference is a real one and represents a change in the general habits of the species, brought about by the breeding season. The bulls and cows—when the latter are not engaged in their maternal duties, which are light enough except when the calves are quite tiny—seem now to be keeping each other company in the sea. The siesta is no longer *chic*.

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Part 6 of Vol. XXXIV. of the **Transactions of the Manchester Geological and Mining Society** contains Mr. H. Bolton's Paper on the 'Fauna and Stratigraphy of the Kent Coalfield.'

The **Transactions of the Manchester Geological and Mining Society**, Vol. XXXIV., part 5, contain an illustrated paper by J. E. Wynfield Rhodes dealing with 'The Drift-Deposits of Prestwich, Manchester and Neighbourhood.'

No. 22 of the **Journal of the Leeds Astronomical Society** (Leeds: R. Jackson & Son, 140 pages, 2s.) is quite as interesting as usual, and among its contents we notice articles on 'Meteorites' by A. Gilligan, B.Sc.; 'The History of the Telescope' by Thomas Benton; 'Solar Eclipses' by Arthur Burnet; 'Maria Gaetana Agnesi' by G. Thorp; 'Meteoric Observations' by W. F. Denning; 'The Modern Equipment of Astronomy' by Rev. Ivo. Gregg, and several shorter notes, as well as a lengthy account of the work of the Society. It is an excellent record for a provincial society.

The Memoirs and Proceedings of the Manchester Lit. and Phil. Society, vol. LIX., part 2, contains four valuable memoirs namely 'A Note on the Behaviour of a Blackbird—a Problem in Mental Development' by T. A. Coward; 'Studies in the Morphology of *Isoëtes*. II. The Analysis of the Stele of the Shoot of *Isoëtes lacustris* in the light of Mature Structure and Apical Development' by Prof. W. H. Lang; 'On two cases of Parallelism in the Aphidæ' by A. W. Rymer Roberts; 'On the Significance of the Geographical Distribution of the Practice of Mummification—A Study of the Migrations of Peoples and the spread of certain Customs and Beliefs' by Prof. G. Elliot Smith. It is very gratifying to find that this old-established society is still literary and philosophical.

The **Annual Report of the Scarborough Philosophical and Archæological Society for 1914** is to hand and includes the Records of the Scarborough Field Naturalists' Society for the same year. Dr. John Irving writes on 'Marine Invertebrate Zoology;' Mr. W. J. Clarke on 'Vertebrate Zoology (other than Aves)'; Mr. A. Harman on 'Mollusca'; Mr. R. A. Taylor on 'Arachnida and Siphonaptera'; Mr. J. A. Hargreaves on 'Geology'; Mr. E. C. Horrell on 'Coleoptera'; Mr. A. S. Tetley on 'Lepidoptera'; Mr. D. W. Bevan on 'Aculeate Hymenoptera'; Mr. A. I. Burnley on 'Phanerogamia'; Mr. A. E. Peck on 'Basidiomycetes'; Mr. T. B. Roe on the 'Remaining Fungi'; Mr. T. N. Roberts on 'Ornithology.' As the frontispiece is a photograph of the Barracks on Castle Hill after the Bombardment of December 16th, 1914.

ARACHNIDA OF THE SAWLEY DISTRICT.

WM. FALCONER,
Slaithwaite, Huddersfield.

A VISIT to the above district from May 22nd to May 25th last enables me to add considerably to the list given in the Naturalist for July, pp 232-3, the species of spiders being increased to 123, and of harvestmen to 4. A few mites were also noted.

The locality with its varied surface features gives every indication of being a very productive one as regards arachnids, but game restrictions prevented me from collecting over much suitable ground, and limited time permitted only imperfect investigation elsewhere. With the exception of *Hahnia pusilla* C.L.K., and *Centromerus arcanus* Camb, the species recorded *loc. cit.*—(inclusive of *Meta menardi* Latr., another fine male of which was boxed on the roof of Ned Hole)—were again met with, and in many instances additional stations obtained for them, while to the rare British spiders there noted may now be added the following:—*Hillhousia misera* Camb., *Diplocentria rivalis* Camb., *Sintula cornigera* Bl., *Notioscopus sarcinatus* Camb., and *Tapinocyba insecta* L. Koch. *Notioscopus*, originally discovered in marshy ground in Bavaria, then in France, has more recently been found in Cleveland; its wide distribution in the last named area, and its occurrences on Sawley High Moor remove all doubt from my mind as to its being indigenous to Britain.* *Tapinocyba insecta* L. Koch has been previously reported from Western and Central Europe and in these islands from Hexham, Leeds, Huddersfield, Bexhill and Ireland. So far as at present known, a few others seem to occur only infrequently or locally in the county, e.g., *Anyphæna accentuata* Walck., *Onesinda minutissima* Camb., *Linyphia pusilla* Sund., *Leptyphantes tenebricola* Wid., *L. flavipes* Bl., *Entelecara trifrons* Camb., *Chiracanthium carnifex* Fabr., and *Porrhomma pygmæum* Bl., while *P. montanum* and *pallidum* Jacks., were until quite recently confounded together under a third name, *P. oblongum* Camb., which rightly belongs to neither,.

Mr. Margerison not only gave invaluable assistance in collecting, but also placed his intimate knowledge of the topography of the district freely at my disposal.

The species marked with a dagger were obtained by him only, those with an asterisk by both, and the unmarked ones by the writer only.

LOCALITIES:—(*a*) Risplith House and Garden; (*b*) Risplith Gills; (*c*) Quarry Wood, Stephenson Bank; (*d*) Picking Gill, bushes at entrance; (*e*) Brim Bray; (*f*) Sawley High Moor; (*g*) Grantley Bank; (*h*) Spa Gill: 1, Wood; 2, Bottoms; 3, Leaves near Stephenson Bridge.

* Vide, 'Origin of the Yorkshire Araneidal Fauna,' *The Naturalist*, March, 1913, p. 135.

ADDITIONS TO LIST.

Spiders.

Harpactes hombergii Scop., ♀s, *a*.
**Oonops pulcher* Templ., *h*3, *c*, *g*.
Clubiona reclusa Camb., ♀, *f*.
**C. diversa* Camb., Sev. ♂s and ♀s, *f*.
Chiracanthium carnifex Fabr., ♀, *f*.
Zora maculata Bl., ♀, *h*2.
Anyphæna accentuata Walck., ♂, *h*1.
**Textrix denticulata* Oliv., ♀s., *a*.
**Antistea elegans*, C. L. Koch, ♀s, *e*, *f*.
**Theridion sisyphium* Clerck, ♂s., *e*, ♀s., *e*.
T. denticulatum Walck., ♂, *a*.
**Pholcomma gibbum* Westr., ♀s., *f*, *g*.
Onesinda minutissima Camb., sev. ♀s., *f*.
**Robertus lividus* Bl., ♂s. ♀s, *c*, *f*.
Bolyphantes luteolus Bl., ♀s, *f*.
Stemonyphantes lineata Linn., ♀s, *f*.
Linyphia pusilla Sund., ♂s, ♀s, *f*.
L. hortensis, Sund., ♀, *b*.
L. clathrata Sund., ♀s, *g*, *h*, *h*1.
Leptyphantes tenebricola Wid., ♂s, ♀, *h*2, *h*3.
L. flavipes Bl., ♂, *h*2.
**Hillhousia misera* Camb., ♂s, ♀s, *f*.
Bathyphantes nigrinus Westr., ♂s, ♀s, *b*, *h*2.
B. gracilis Bl., ♂, ♀s, *f*.
Porrhomma pygmaeum Bl., ♀, *d*.
P. montanum Jacks., ♀, *f*.
P. pallidum Jacks., ♀, *c*.
**Hilaira uncata* Camb., ♂s, ♀s, *e*, *f*.
Oreonetides abnormis Bl., ♂, ♀s, *f*.
Centromerus expertus Camb., ♀, *e*.
C. prudens Camb., ♀, *f*.
**Centromeria concinnus* Thor., ♀s, *f*.
C. bicolor Bl., ♀, *f*.
Diplocentria rivalis Camb., ♀, *f*.
Microneta viaria Bl., ♂s, ♀s, *b*, *c*.
**Agyneta decora* Camb., ♂s, ♀s, *f*.
Sintula cornigera Bl., ♂, ♀s, *f*.
**Rhabdoria diluta* Camb., ♀s, *f*.
Gongylidium rufipes Sund., ♂, ♀s, *h*1.
†*Œdothorax fuscus* Bl., ♀, *b*.
Œ. agrestis Bl., ♂, *e*.
Œ. gibbosum Bl., ♂s, ♀s, *e*, *f*.
Œ. tuberosum Bl., ♂s, ♀s, *e*, *f*.
Notioscopus sarcinatus Camb., 8 ♀s, *f*.
Erigone dentipalpis Wid., ♂, ♀, *e*, *f*.
E. atra Bl., ♂, *f*.
Lophomma punctatum Bl., ♀ *e*.
Dicymbium nigrum Bl., ♂, ♀, *h*2.
**Neriene rubella* Bl., ♀s, *b*, *c*, *g*, *h*3.
**Enidia bituberculata* Wid., ♀s, *d*, *e*.
**Dismodicus bifrons* Bl., ♂s, ♀s, *d*, *e*, *f*.
**Diplocephalus permixtus* Camb., ♂s, ♀s, *e*.
**D. latifrons* Camb., ♂s, ♀s, *c*, *h*3.
Entelecara erythropus Westr., ♀, *h*2.
†*E. trifrons* Cambs., ♂, *b*.
Savignia frontata Bl., ♀, *e*.
**Peponocranium ludicrum* Camb., ♂s, ♀s, *d*, *f*.
**Pocadicnemis pumila* Bl., ♂s, ♀s, *f*, *g*, *h*2, *h*3.
**Troxochrus hiemalis* Bl., ♂, ♀s, *f*.
Cnephalocotes obscurus Bl., ♂, *f*.
Tapinocyba insecta L. Koch, ♀, *f*.
Wideria antica Wid., ♀s, *f*.
**Walckenaera nudipalpis* Westr., ♀s, *f*.
Cornicularia cuspidata Bl., ♀, *e*.
C. unicornis Camb., ♀, *e*.
Ceratinella brevis Wid., ♀s, *h*2, *b*.
Erofurcata Vill., ♂, ♀s, *b*, *f*, *g*.
Pachygnatha degeerii Sund., ♂, ♀s, *e*, *g*.
Epeira diademata Clerck, imm., *d*.
Zilla x-notata Clerck., *a*.
**Xysticus cristatus* Clerck., imm. and ad. ♀, *f*, *g*.
**Pirata piraticus* Clerck, ♂s, ♀s, *e*, *f*.
Trochosa terricola Thor., ♀s, *f*.
**Tarentula pulverulenta* Clerck., ♂s, ♀s, *d*, *e*, *f*.
**Lycosa amentata* Clerck, ♂s, ♀s, *e*, *h*1.
**L. pullata* Clerck, ♂s, ♀s, *b*, *d*, *e*, *f*.
**Neon reticulatus* Bl., ♀s, *b*, *h*2.

Harvestmen.

Oligolophus ephippiatus C. Koch, *d*, *h*1.

Mites.

Oribates globulus Nic., one, *e*.
O. edwardsii, Nic., several, *f*.
Oppia bipilis Herm., many, *f*.
Smaris expalpis Herm., one, *c*.
Ottonia ramosa Geo., var. *similis* Halb., three, *c*.
Erythraeus nemorum Koch, sev., *f*.
Rhyncolophus globiger Berl., one, *e*.
Gamasus crassipes Linn., many, *c*, *f*, *h*2, *h*3.
G. coleoptratorum Linn., one each, *c*, *h*3.
G. runciger Berl., one, *f*.
Hypoaspis aculeifer G. Can, many, *b*, *f*, *h*2.

YORKSHIRE NATURALISTS AT SALTBURN.

(*Continued from page 337*).

VERTEBRATE ZOOLOGY.—Mr. H. B. Booth, F.Z.S., reports:—On Sunday the shore below Huntcliff was explored. The Jackdaws had all left, and the chief ornithological attraction was the colony of two to three hundred pairs of Herring Gulls on the cliffs, with their young in various stages of growth. Most of the youngsters could fly, but several were being fed by their parents, and still unable to fly. One pair of birds was undoubtedly still incubating ; probably the first nest had come to grief. Near to the Saltburn end of the cliffs was a fairly large colony of House Martins, which had built all their nests near to the top of the cliff, and immediately below the vegetation line. A pair and another family of Rock Pipits were noted. No waders were seen, although the rock-strewn shore was an ideal place for such species as the Purple Sandpiper, Turnstone, Oystercatcher, etc., which no doubt would all be in evidence a few weeks later. Over the sea a mist prevented observation ; but three Cormorants were seen flying south. One or two Lesser Black-backed Gulls were noted, and several Black-headed Gulls (both mature and immature) were at the Saltburn and Skinningrove ends of the shore ; but not any in between. A discussion took place as to why such noble cliffs should not be tenanted by more sea-fowl ? There were plenty of ledges for Guillemots, and apparently much more suitable nesting sites for Puffins than on the Flamborough cliffs, and apparently equally as good fishing grounds in the neighbourhood. The difference between the two places was chiefly a geological one, and surely birds are not geologists ?* The Huntcliff cliffs are a splendid site for a Peregrine Falcon's eyrie and yet why do they not nest there ? The only reason the writer could perceive was the scarcity of the pigeon tribe.

In the wooded ravine immediately behind the Skinningrove end of the cliffs there was a fair sprinkling of Linnets. We noticed a Spotted Flycatcher capture a Magpie Moth after several abortive attempts.

The Monday's ramble through the Skelton Valley was too hurried to do it justice. It is a place that would amply repay a visit in spring. The Goldcrest, Dipper and Tree Sparrow (near Kirkleighton) were noted. It appeared to the writer that the Chaffinch was not quite so common (though not by any means rare) in this district, compared with its great abundance elsewhere in Yorkshire. This is also a district where Starlings commonly perch upon sheep's backs. This habit requires further and general observation. Even in our county it

* Why not ? Some birds are said to be quite sensible.—Ed.

varies very considerably in different districts ; and if thoroughly followed up may give some clue to their different races, or to their migratory movements, or whether in certain districts they are residents. I cannot conclude without some remarks on the glens or ravines in the neighbourhood of Saltburn. With their thick undergrowth of vegetation they appear to be ideal places for tired over-sea migratory small birds to drop into. The ravine would prove interesting to any ornithologist who could spend a few days or a few weeks there during the autumnal migrations ; although I fear that to be up-to-date he would require a gun, in order to distinguish the various local races or sub-species that are now in fashion.

Coleoptera.—Mr. M. L. Thompson reports that the following Beetles were met with along the route in Kilton Wood on the Saturday :—

Tachyporus obtusus L.
Stenus impressus Germ.
Oxytelus rugosus F.
Anthophagus testaceus Grav.
Anthobium minutum F.
A. ophthalmicum Pk.
Adalia obliterata L.
Brachypterus urticæ F.
Cercus pedicularius L.
C. bipustulatus Pk.
Epuræa melina Ers.
Meligethes æneus F.
M. brunnicornis Stm.
Byturus tomentosus F.
Cychramus fungicola Hur.
Micrambe vini Panz.
Helodes minuta L.
Cyphon coarctatus Pk.
Rhagonycha fulva Scop.
Malthinus punctatus Fourc.
Malthodes marginatus Lat.
M. minimus L.
Dryophilus pusillus Gyll.
Strangalia armata Hbst.
Grammoptera ruficornis F.
Cryptocephalus labiatus L.
Chalcoides fulricornis F.
Psylliodes napi Roch.
Anaspis rufilabris Gyll.
A. ruficollis F.
A. maculata Fourc.
Apion pisi F.
Otiorhynchus picipes F.
Polydrusus pterygomalis Sch.
Phyllobius calcaratus F.
P. argentatus L.
Dorytomus maculatus Marsh.
D. pectoralis Gyll.
Anthonomus ulmi De G.
Cœliodes quercus F.

Flowering Plants.—Mr. W. E. L. Wattam reports :—The botanists had a truly enjoyable time, for everywhere was a feast of floral wealth that could not fail but please. On the coast, near the Skinningrove Ironworks, is a fair sized sandbank controlled by *Ammophila arundinacea* and *Triticum junceum*. Near by was found *Cakile maritima*, *Honckenya peploides*, *Senecio viscosus*, and *Carduus tennuiflorus*. The large falls of boulder clay were tenanted chiefly with clovers, *Plantago maritima*, *Vicia Cracca*, and an abundance of *Tussilago Farfara*, in fact some of the more recent falls were dominated by this plant, along with *Glyceria maritima* and *G. procumbens*. In the ravine close by, through which passage was made to the cliff tops, is a great jungle growth of hawthorn, hazel, blackthorn, wild rose, privet, bramble and furze. *Geranium pratense* made intense blue belts of colour ; *Gymnadenia conopsea* was

not uncommon; *Lonicera Periclymenum* clambered amidst the tangle of growth, shedding a delightful fragrance from its clusters of bloom. *Torilis Anthriscus, Inula dysenterica, Linum catharticum, Equisetum palustre,* and *E. maximum* were also listed. Along the cliff tops *Ononis arvensis, Anthyllis Vulneraria, Agrimonia Eupatoria, Carlina vulgaris, Betonica officinalis,* and *Gymnadenia conopsea* were abundant, and there were also *Echium vulgare, Euphorbia exigua, Sherardia arvensis, Reseda luteola, Bromus giganteus* and *Hordeum murinum.*

It was much to be regretted that a heavy storm occurred shortly after arrival in the Skelton valley, as this made a close investigation of the woodland flora impossible. However, much of interest was seen at the Guisborough end of the valley. A perfect picture was the immense wealth of blossom yielded by *Campanula latifolia* in a young coniferous wood to the left. The streamside flora was glorious: thickets of *Epilobium hirsutum, Eupatorium cannabinum, Valeriana officinalis, Sparganium ramosum, Conium maculatum, Spiræa Ulmaria,* and *Scrophularia aquatica,* with the blue of *Myosotis palustris* linking up the gaps. Along the valley were numerous other plants, of which may be mentioned *Hypericum pulchrum, H. quadrangulum, H. hirsutum, Brassica campestris,* and *Geranium pratense.* The arboreal features of the valley are especially magnificient. Wild Cherry and Blackthorn were in fruit.

Mycology.—Miss C. A. Cooper writes:—On Friday afternoon the mycologists investigated the little wood surrounding Marske Mill and found quite a number of specimens, especially a fine group of *Psathyrella disseminata.* On Saturday the party visited the Kilton Woods where was seen a large number of Boleti, chiefly *Boletus elegans,* but *subtomentosus* and *flavus* were taken. On Monday, in spite of heavy rain for a period, much good work was done. The pastures contained a large number of *Hygrophori, chlorophanus* and *psittacinus* being recorded. Our indefatigable collector, Mr. Jones, boxed the favourite Bird's Nest fungus, *Crucibulum vulgare,* and we got fine specimens of *Otidea leporina, Acetabulum vulgaris,* and *Otidea aurantia.* The Clavarias were very fine in the pastures, particularly *vermicularis* in splendid condition. A very fine specimen of *Isaria farinosa,* the conidial form of *Cordiceps militaris,* were obtained. Eighty five species for two full days work was satisfactory. Some of the less common specimens were sent for identification to Messrs. Peck and Roe of Scarbro', who were kind enough to help.

The following is the list of some of the species noted, viz.:—

Leucosporæ.
Amanitopsis strangulata.
Lepiota mastoidea.
Russula ochracea.
Russula integra.
R. vitellina.
R. pectinata.
R. chloroides.

Mycena vitilis.
M. cinerea.
Collybia tenacella.
Lactarius deliciosus.
L. cimicarius.
Omphalia fibula var. *swartzii.*

RHODOSPOREÆ.

Entoloma ameides.
Clitophilus carneoalbus.
Leptonia asprella.

OCHROSPOREÆ.

Inocybe godeyi.
I. eutheles.
Hebeloma crustuliniforme.
Cortinarius lepidopus.

MELANOSPOREÆ.

Gomphidius glutinosus.
Coprinus micaceus.
Psathyra conopilea.

POLYPORACEÆ.

Boletus laricinus.
B. elegans.

TREMELLINACEÆ.

Hirneola auricula judæ.

NIDULARIACEÆ.

Crucibulum vulgare.

PHALLOIDEACEÆ.

Mutinus caninus.

ASCOMYCETES.

Otidea leporina.
O. aurantia.

Sub-Order PYRENOMYCETES.

Xylaria carpophila.

Sub-Order DISCOMYCETES.

Acetabulum vulgaris.
Sphaerospora asperior.
Pseudo-peziza discolor.

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We regret to record the death of Jean Henri Fabre, the famous French entomologist.

The Board of Agriculture special leaflets Nos. 38 and 39 deal with ' Bracken as Litter ' and ' Potato Disease ' respectively.

We see that Dr. E. C. Chappell has lectured to the Spalding Gentlemen's Society on ' The Shrapnel and High Explosive Shell,' with *concrete* illustrations.

We have received parts 19-20 (pages 89-103 and 5 plates) of *The Birds of the Huddersfield District,* by S. L. and F. O. Mosley, which completes this work, at last.

From Mr. E. A. Martin, F.G.S., we have received an interesting paper on ' Problems in Coast Erosion,' and though this deals largely with the south coast, reference is made to the erosion taking place in Yorkshire and other districts. Mr. Martin also favours us with his paper on ' Brighton's Lost River.'

The Executive Committee of the Yorkshire Naturalists' Union suggests the following excursions for 1916 :—22nd to 24th April (Easter week-end), Malton ; Saturday, 20th May, Bolton Woods ; 10th to 12th June (Whit week-end), Middleham ; Saturday, 8th July, Driffield ; and 5th to 7th August (Bank Holiday week-end), Wentbridge, near Pontefract.

A recent obituary notice recalls memories of the First Yorkshire Fungus Foray at Leeds in 1881. One prominent feature was a Fungus Feast at Powolny's Restaurant, when the fungi were cooked to perfection from recipes from an old monastic source by Mr. E. Adolf Powolny, the celebrated culinary artist of Leeds. Mr. Powolny died on the 17th September at a ripe old age, and his geniality and skill are not forgotten by some of us.

Mr. G. Laughton, of Leeds, informs us that whilst in the garden on August 21st he was watching a bee gathering honey from some snapdragons. After a time, it settled on a flower, and after a hard struggle managed to force the two ' lips ' or ' jaws ' apart and enter the flower. But then it stuck. It could not get back however hard it tried. It pushed and squirmed and wriggled, but to no effect. After a time, he opened the ' lips ' apart a little, and the bee then emerged, covered with pollen on its back, and flew away.' Such occurrences are recorded with other plants, e.g., the ' Red-hot Poker.'

FIELD NOTES.

BIRDS.

Immature Gannet at Withernsea.—A young Gannet in fine plumage was caught alive at Withernsea on October 14th, and brought to the Hull Museum by Mr. Joseph Summers. It had apparently been maimed in some way. It was naturally very ferocious, and could be persuaded to eat nothing but the eyes of fishes, which it eagerly pecked from the fish-heads.—T.S.

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ENTOMOLOGY.

***Berytus montivagus* Fieb., etc., at Morecambe.**—On June 27th last I found this delicate creature in numbers at Hest Bank near Morecambe. It occurred under stones, lying among the Rest Harrow (*Ononis* sp.), between the path and the sea. *Calocoris sexguttatus* Fab. was common on various plants at the same time and place.—Jas. Murray, Carlisle.

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BOTANY.

'Aliens' in the Calder Valley.—About twenty representatives of the Botanical Section of the Yorkshire Naturalists' Union had a good time among the aliens and casuals in the Mirfield district of the Calder valley, on August 28th. Premier position must be given to the beautiful Crown Vetch (*Coronilla varia*), which has taken up about forty or fifty square yards in the vicinity of Lady Wood, Mirfield. Many alien plants were seen which we get year after year, such as *Sisymbrium austriacum, Lepidium Draba, Reseda phyteuma, Malva pusilla, Impatiens biflora* and *I. parviflora, Trigonella caerulea, Medicago sativa, Melilotus parviflora, Trifolium resupinatum, Lathyrus sativus* and *L. annuus, Cotula aurea, Centaurea solstitialis*; the spurge *Euphorbia Esula* on the river bank, the pink flowered bindweed *Volvus sepium* var. *incarnata*, and many others. Many rare English plants were noted, and we get a goodly number of these each year, which in some cases are well established, although they are only aliens to our district:—*Silene nutans, Erodium moschatum, Medicago falcata, Vicia lutea, Lathyrus Aphaca, Caucalis daucoides* and *C. latifolia, Senecio viscosus, Centaurea Calcitrapa, Hyoscyamus niger, Echium vulgare*, and many grasses. During the afternoon other plants were picked up, viz., a form of *Agropyron repens*, a very variable grass, and a Labiate, which has been determined since, comes very near *Galeopsis Ladanum* var. *intermedium*.—F. W.

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The Selborne Magazine for September contains a note on 'Reckless Botanists.'

REVIEWS AND BOOK NOTICES.

Evolution and the War. By **P. Chalmers Mitchell.** London: J. Murray, 1915, pp. 114, 2s. 6d. net. This little book is based on three lectures delivered by Dr. Chalmers Mitchell at the Royal Institution last February, but it contains much information which possibly might not be considered quite suitable for lectures there. Dr. Mitchell deals with the subject from a point of view of 'War and the Struggle for Existence'; 'The Struggle for Existence amongst Animals'; 'Nationality and Race'; 'The Production of Nationality: Selective Factors and Epigenetic Factors'; and incidently the book presents some difficult biological problems in a slight and topical form.

Elementary Photo-Micrography. By **W. Bagshaw, F.R.M.S.,** pp. 143, 3rd edition, Iliffe, 1915, 2s. 6d. net. Since the first edition of this work appeared in 1902, considerable additions have been made both in the text and illustrations. The book has been doubled in size and is illustrated by 15 plates, of which two are in colours. Those familiar with Mr. Bagshaw's work with the microscope will find this book characteristic of the author, a clear and straightforward account of the simplest processes necessary for good results. He shows that expensive apparatus is not essential, and those microscopists more anxious about good results than the display of costly accessories, will find in this work a really useful guide. Beautiful illustrations are given of photographs taken by direct, transmitted and reflected light, also by dark-ground and oblique illumination, as well as by flashlight and polarised light.

Spencer Fullerton Baird: a Biography. By **William H. Dall, A.M., D.Sc.** London: J. B. Lippincott, Company, 462 pp., 15s. net. This work gives the life of a great naturalist, the friend of Agassiz and Audubon, the head of the Smithsonian Institution, and the organizer of the Fish Commission. It includes much interesting correspondence with eminent men of science and military leaders. Natural history in America is most of all indebted to two remarkable men, Professor Louis Agassiz and Professor Spencer F. Baird. Their activities in a public sense in this country began about the same time, Agassiz, the enthusiastic inspiring teacher, and Baird, the efficient, hardworking and lovable organizer, complemented each other. Prof. Baird was a born naturalist and organizer of methods and men. His biography is not a history of explorations nor a record of technical investigations; but an account of the life and relation to them of a singularly eminent, able, efficient and modest devotee of the natural sciences. Apart from the scientific side of the activities it endeavours to make the reader acquainted with the characteristics of a pure and lovable leader of men to whose modesty and self-sacrifice America owes a debt which is still appreciated only by a select few. There are several illustrations.

Field Archaeology as Illustrated by Hampshire. By **J. P. Williams-Freeman, M.D.** London: Macmillan & Co., Ltd., 1915, 462 pp., 15s. net. This volume admirably illustrates the antiquities of a single county and can also be taken as a key to the prehistoric earthworks of Britain. The author has unquestionably had unrivalled opportunity for studying the early antiquities of his county, and while in many respects Hampshire may possess advantages over many counties, others might have produced a similar volume. Hampshire is to be congratulated on leading the way. Descriptions of ancient roadways and earthworks occupy the bulk of the volume; numerous carefully drawn plans of the latter forming a specially valuable feature. The author's dedication is somewhat unusual, namely: 'To all those friends (or to those who still remain the same), whom I have pressed into the service of visiting these camps, who have clambered up the heights and slid into the depths, who have struggled with the tape and suffered under the rods, who have often assumed the gait and sometimes the diet of the serpent, and above all, who have borne in silence (more or less), the inflictions of a man with a hobby, I dedicate this book in memory of (to me) many pleasant expeditions.'

The Geology of the Country near Lymington and Portsmouth. By **H. J. Osborne White, F.G.S.**, 1915, 78 pages, 1s. 6d. The Geological Survey has issued this Memoir in explanation of Sheets 330 and 331. The area has furnished classic names to British Geology, such as Barton, Bracklesham, Brockenhurst and Hordle (or Hordwell), but in consequence perhaps of the surpassing claims of the neighbouring Isle of Wight had not been made the subject of any seperate memoir, except that some well-sections had been published in the Memoirs dealing with the water supply of Hampshire and Sussex. Mr. Osborne White, who had recently completed a Memoir on the adjacent Sheet 316, was fortunately able once more to give his services. In the present volume he has not only summarised what was already known of the local Geology, but has contributed many valuable observations made by himself.

British Birds, written and illustrated by **A. Thorburn, F.Z.S.** With eighty plates in colour, showing over four hundred species. In four volumes. £6 6s. net. Longman, Green & Co., 1915, Vol. I., large 4to, 143 pages and 20 plates. In recent years naturalists have taken a particularly great interest in bird life, and enormous numbers of volumes of varying merit have been placed on the market. Some have been of altogether exceptional worth. But, for life-like coloured representations of the various species we have seen no publication to compare with the present work. Each species has a page, usually filled, devoted to a description of its habits and characteristics, distribution, nesting, etc. It is in the illustrations however, where the value of the work lies. The artist-author has taken scrupulous care in portraying the colours and attitude, and even to some extent the typical surroundings of the various species, and as a number of allied forms occur on each plate a comparison is readily made. For instance on plate 10 are representations of the Long-tailed, Marsh, Great, Bearded, Coal, Crested and Blue Titmouse. With the aid of this plate the identification of the various species is a very simple matter. And the drawings do not suffer from being over-coloured, which is a usual fault in books of this sort. Among so many excellent plates it is perhaps difficult to choose, but for artistic merit we think that plate 20, on which are representations of the Magpie, Raven and Jackdaw, would be difficult to beat. We must say, however, that the plates, being tinted right to the trimmed edge, seem to lack 'finish.' One feels almost inclined to cut each plate out and paste it on a larger mount! Perhaps this is done in the large paper edition; if so, it must be perfect. But, its price is £12 12s., more than the cost of 40 years' subscription to *The Naturalist*! We should like to congratulate Mr. Thornburn and his publishers on the excellence of the work, and we can only hope that the present unfortunate times will not unduly interfere with its sale.

Life Histories of African Game Animals. By **Theodore Roosevelt and Edmund Heller.** London: J. Murray, 1915, 2 vols., 798 pp., 42s. net. In these magnificent volumes the ex-president of the United States, together with his companion Mr. Edmund Heller, describe in great detail and in a very fascinating manner the life histories (and death) of many African game mammals which they encountered during their well-known journey in the Dark Continent. In their opinion the life histories of these game mammals offer an almost virgin field for investigation and study, and certainly the authors have taken great pains to record the various observations they made. Probably a better idea of the enormous field covered by these volumes can be obtained from the following headings of the chapters:—The Country and Its History; Derivation of the Fauna, Geographically and Paleontologically; The Flora of East and Middle Africa and its Relation to the Fauna; Concealing and Revealing Coloration and their Relation to Natural Selection; Game Preserves; Lion; Leopard and Cheetah; Spotted Hyena, Striped Hyena and Hunting Dog; Pigs; Hippopotamus; Reticulated and Common Giraffes; Roan,

Sable and Oryx; Wildebeest, Damaliscus, and Hartebeest; Buffaloes; Bushbucks, Sitatungas, Koodoos, Bongos, and Elands; Waterbucks and Reedbucks; Duikers and Small Antelopes; Gazelles and their Allies; Dikdiks; Hook-Lipped or Black Rhinoceros; White or Square-Mouthed Rhinoceros; Common Zebra or Bonte-Quagga; Grévy Zebra; Elephants; Equipment, Arms and Preservation of Specimens. There is also a valuable bibliography of East Equatorial Africa. As illustrative of the magnitude of scientific research by Americans we may say that the expedition was fitted out at the instigation of the Smithsonian Institution, Mr. Roosevelt himself paying $\frac{2}{5}$ths of the expenses. As a result of the expedition 'the biological collections in the National Museum from East Africa, are probably the most complete of any in the world.' The following is a list of the specimens obtained:—

	Specimens.
Mammals	5,013
Birds	4,453
Birds' Eggs and Nests	131
Reptiles and Batrachians	2,322
Fish	447
Plants	5,135
Insects	3,500
Shells	1,500
Miscellaneous Invertebrates	650
Total	23,151

The volumes are remarkably well produced and illustrated, and form quite a picture gallery of photographs of African game. The spelling, of course, is American.

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The Irish Naturalist for October contains a summary of 'The Clare Island Survey' by Dr. R. F. Scharff.

The Geological Magazine Nos. 615-616 contain an article on 'The Ice Age in England' by Dr. Nils Olof Holst.

In *The Zoologist* for August, Dr. J. M. Dewar writes on 'The Relation of the Oyster Catcher to its Natural Environment.'

The Geological Magazine for August contains an account of 'A New Oxfordian Plesiosaur,' by Wm. R. Smellie, and 'Notes on the River Tyne Drainage Area,' by E. Merrick.

British Birds for September contains 'Notes on the Breeding Habits of the Asiatic Golden Plover,' by Maud D. Haviland. There is also a remarkably good crop of rare birds 'seen in the flesh,' in Sussex.

Sir Thomas Holland's address to the Conference of Delegates attending the meeting of the British Association, on 'The Organisation of Science,' referred to in these columns last month, is printed in extenso in *Nature* for Sept. 16th.

The Scottish Naturalist for October includes papers by Wm. Eagle Clarke on 'The Wren of St. Kilda: its Status, Plumages, and Habits'; by Wm. Taylor on 'The History of the Triassic Reptile *Scleromochlus taylori*'; and by W. E. Collinge on 'Some Observations on the Life History and Habits of the Terrestrial Isopoda (Woodlice).'

In *The Entomologist's Monthly Magazine* for September, Mr. R. S. Bagnall appeals for specimens of British *Campodeidae* (*Thysanura*). From the limited specimens already available he has found three additions to our known fauna, some being from Northumberland and Durham. In the same journal Mr. M. G. L. Perkins states that the specimen which he previously recorded as *Rhynchites auratus* ♀ turns out to be merely a ♀ of *Byctiscus betuleti*.

THE COUNTY OF THE WHITE ROSE

AN INTRODUCTION TO THE HISTORY AND ANTIQUITIES OF YORKSHIRE

BY

A. C. PRICE, M.A.

Formerly Scholar of Pembroke College, Oxford
Author of "Leeds and its Neighbourhood," etc.

415 pages, crown 8vo, with upwards of 70 illustrations and a folding map of the three Ridings, tastefully bound in Art Cloth Boards lettered in gold with rose in white foil and gilt top. 3s. 6d. net.

CONTENTS.—The Land, The Early Inhabitants, Yorkshire under Roman Rule, The Anglian Kings, The Danes, The Norman Conquest, The Yorkshire Barons, Churches and Abbeys, Mediæval Towns, The Tudors, The Stuarts, Modern Yorkshire.

THIS work has been compiled to assist the large number of persons—residents and visitors—who take interest in Castles, Abbeys, Churches, Battlefields, etc., but from want of a proper historical basis, fail as a rule to understand the allusions and technicalities in the ordinary guide books. It will also help intelligent boys and girls who desire to study the history of their County, on the lines advocated by the Board of Education. The book is the only one of a reasonable size which deals at all adequately with the history of Yorkshire as a whole. Many of the illustrations have been reproduced from photographs by Mr. Godfrey Bingley, Mr. A. C. Parry and Mr. R. Stockdale. To several chapters, notes are appended to guide readers who might wish to extend their studies, and the value of the book is further enhanced by the provision of a very exhaustive Index of names and places.

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THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
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AND
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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, F.R.S. F.L.S., GEO. T. PORRITT, F.L.S., F.E.S.,
Prof. P. F. KENDALL, M.Sc., F.G.S., JOHN W. TAYLOR, M.Sc.,
T. H. NELSON, M.Sc., M.B.O.U., RILEY FORTUNE, F.Z.S.

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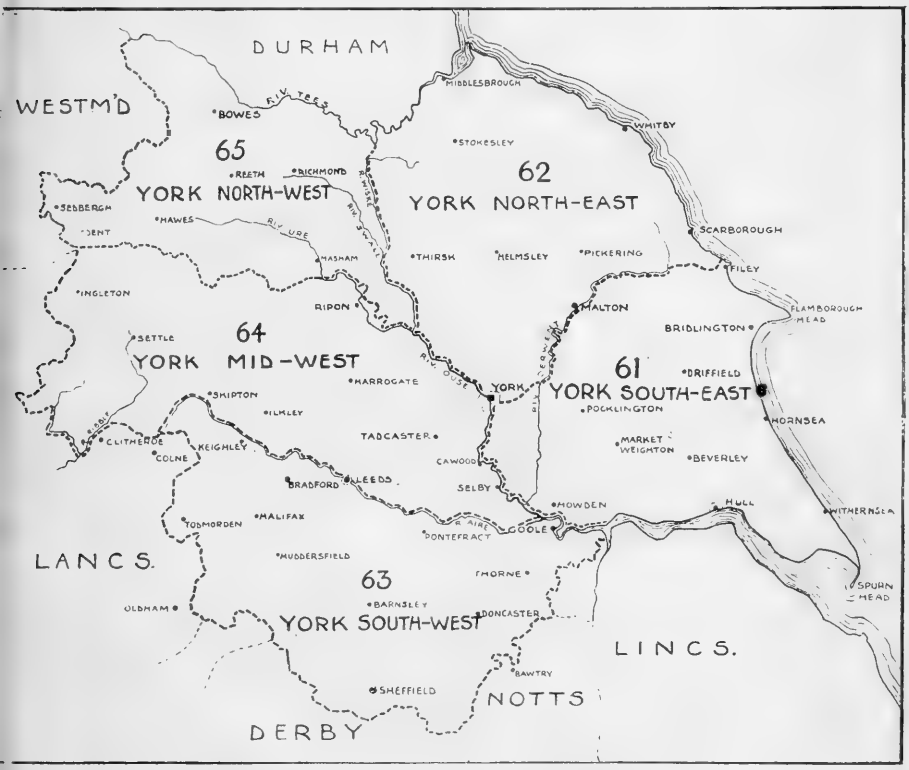
NOTES AND COMMENTS.

WATSONIAN VICE-COUNTIES.

The map of Yorkshire given herewith will enable our readers to readily record their captures according to the Vice-Counties as given in Watson's Topographical Botany. It has been prepared with the assistance of Mr. W. Denison Roebuck.

V.C. 61, York S.E., is the East Riding, and includes a small portion of York City.



The Watsonian Vice-Counties of Yorkshire.

V.C. 62, York North-East, is divided from V.C. 65, York North-West, by the line of the Rivers Wiske and Swale. The line starts from the southernmost bend of the Tees to the bend of the Wiske and thence down that river and the Swale to the latter's junction with Ure. It includes part of York City east of the River Ouse.

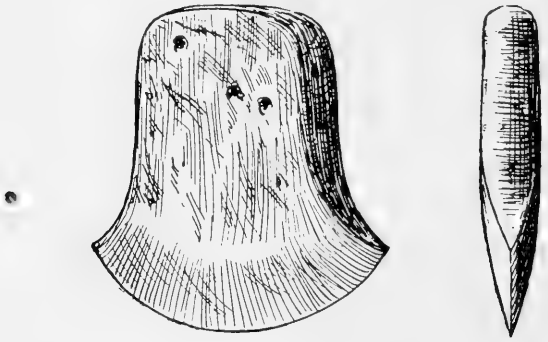
64 York Mid-West and 63 York South-West are separated from each other by the Leeds and Liverpool Canal from Foul-

bridge to Leeds, and thence by the Aire below Leeds, which in practice is taken to be the Aire and Calder Navigation, i.e., the canalized portion of the River Aire, from Leeds down to the junction with the Ouse. The part of York City which lies west of the Ouse is in V.C. 64, York Mid-West.

65 York North-West includes also the Sedbergh and Dent area of the West Riding, cut off by the watershed line from Gragreth across the summit of Whernside to near Newby Head.

SHEFFIELD ARCHÆOLOGISTS.

We are glad to see that Sheffield now has its Archæological Society, viz., the Hunter Archæological Society, named after Joseph Hunter, the historian. The first part of its Transactions (134 pages) contains many papers of local antiquarian interest, some of which are illustrated. There are figures of some fine



examples of old furniture collected by the late Reginald Gatty; and Mr. Thomas Winder in his account of 'Archæological Finds in and around Hallamshire,' figures some bronze axes, etc., one of which is of a very unusual type. We have not seen the original specimen, but from the illustration given, which we are kindly permitted to reproduce herewith, it seems likely that the axe may be made from the lower part of a palstave, such as is figured on page 100.

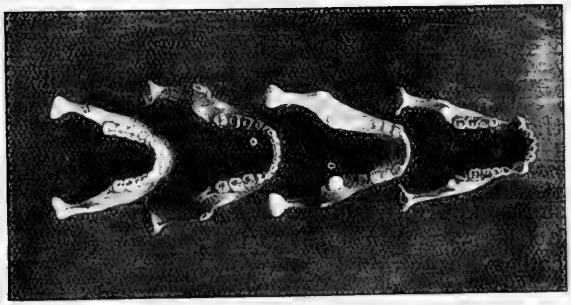
LIVERPOOL GEOLOGISTS.

The Proceedings of the Liverpool Geological Society, vol. XII., part 2, recently to hand, is an exceptionally valuable number and contains some important contributions to geological science. Mr. W. A. Whitehead gives his presidential address on 'The Formation of a Sandstone'; Mr. J. W. Dunn writes on 'Skiddaw and the Rocks of Borrowdale'; Mr. H. W. Greenwood on 'An Example of the paragenesis of Marcasite, Wurtzite, and Calcite, and its Significance,' and a

' Note on a Boring at Vauxhall Distillery ' ; Mr. F. T. Maidwell writes on ' Some Sections in the Lower Keuper of Runcorn Hill,' ' Geological Notes on Some Recent Excavations at West Bank Dock, Widnes,' the latter with Microscopic Notes by Mr. J. E. Wynfield Rhodes ; and Mr. T. A. Jones writes on ' The Presence of Tourmaline in Eskdale Granite.'

APES TO MODERN MAN.

We have received from Mr. M. F. Hopson a remarkably well



illustrated account of ' Apes to Modern Man,' which contains some of his contributions to the British Dental Journal (8vo. 38 pages). The author deals very fully with the subject. His first illustration is of ' Flint Implement found in Gray's Inn Lane,' and he concludes with figure 66 showing the ' Mandible of a Gorilla, lateral view.' Mr. Hopson refers in detail to the question of the dentition of the various species enumerated, and pays particular attention to the remarkable find at Piltdown. Through Mr. Hopson's kindness we are able to show side views and occlusal surfaces of the jaws of ' Chimpanzee, Piltdown, Heidelberg, and Modern Man.'

FOSSIL REPTILIA.

We learn from the press that at the opening lecture at the Brighton and Hove Natural History and Philosophical Society Mr. A. M. B. Anderson gave a lecture on 'Some Remains of Fossil Reptilia and their State of Mineralization.' Mr. Anderson prefaced his remarks by handing the Chairman for circulation a British Museum guide-book, in which were figures of the fossil reptiles whose remains he proposed to describe, and pointing to the large number of specimens placed before them said that, at present, he could not recognise more than four Orders of the Reptilia represented by them; these were the Crocodilia, Ichthyoperygia (sic), Sauropterygia, and Chelonia. Of the first he had undoubted ilia, and other bones, provisionally attributed to Steneosaurus. Of the second he had undoubted coracoids, and many other bones of a form resembling Opthalmosaurus. Of the third he had hundreds of specimens of vertebrae, pectoral and pelvic girdles, and limb-bones, of forms allied to Plisoaurus (*sic*), Peloueustes (*sic*), Cimoliosaurus, and Plesiosaurus, all of which he exhibited and explained at length. Of the fourth, he had a few remains of a turtle, provisionally referred to Chelone hoffmanni. He then shewed specimens of vertebræ in which the neural canal was open, and in some, closed by silica. From the cervical to the candal vertebræ, many specimens were exhibited, some of the sacrals of very large dimensions. There were also long-bones split lengthwise, in which the medullary cavity was exposed, and some other bones, with doubtful traces of integument upon them. It was possible that other remains of Mosasaurus gracilis, than those recorded by Owen, would occur (those were vertebræ from Lewes, and from Kemp Town, Brighton, found in the chalk).

FLINT 'BONES.'

Finishing his descriptions of the bones, he said he had now arrived at the second, or subsidiary stage of his lecture, which was to call the attention of his audience to the startling fact that the whole of his collection—without exception—consisted of silicified remains; being in point of fact absolute flint; some of it black and shining, some chalcedonic, some porcelaneous, some partly ferrous, and lastly a few unmistakably cherty. In some instances he had found traces of the former cancellated structure of the original bone, but, usually the whole was silicified, whether by infiltration, or replacement of the calcium phospate and carbonate by colloid, or any other form of silica, he could not say; but he called upon any chemical expert present, or one known to the Society, to collaborate in the elucidation of this vexed problem. He then briefly gave the views of others upon the formation and development of flint.

ANOTHER VIEW.

Mr. H. S. Toms, Curator of the Brighton Museum, said that while admiring the energy of the lecturer and recognising the enormous amount of work entailed, often lasting until the small hours of the morning, he, nevertheless, totally disagreed with Mr. Anderson's conclusions, and said, emphatically, that not one of the specimens handed around, nor those lying on the table, nor those in the large exhibition case behind the lecturer, shewed the smallest trace of organic structure; they were simply lumps of flint of curious shapes, such as were found abundantly in the county; especially those showing a median fracture, which he, himself, had found. There were many such accidental forms in the Museum and some like Mr. Anderson's so-called 'bones.' Often were brought to him flints, which resembled cats' heads, birds' heads, horses' heads, and the like, and personally he considered the Museum should collect and exhibit such curious mimicry of living objects. On a further survey of the specimens exhibited he stated, still more emphatically, that all the specimens were accidental and amorphous and that Mr. Anderson was entirely wrong in his attempt to reconcile them with any kind of bones.

A REPLY.

The Lecturer, in replying, charged Mr. Toms with coming there with mind and motive fully prepared to smash what he did not understand and what he considered a misleading and erroneous theory and this in spite of wealth and material, which any palæontologist would recognise at a glance. He was surprised that Mr. Toms, after twenty years installation in the Museum, should not yet know his 'bones.' 'Did Mr. Toms, or anyone else in that room, imagine that he, Mr. Anderson, would imperil his reputation, no mean one, as a palæontologist and geologist, by coming before them with an ill-digested, ignorant theory! This was no theory but the plain fact of the existence of silicified bones, and he was prepared to defer to "the opinion of any scientific body which did know something." Or if the greatest minds in the geological world or the great palæontologists of the British Museum, or of any other State Museums abroad, said he was wrong, he was prepared to hide his diminished head and never more lay claim to being what the scientfic men of the old and new world considered him to be!' They evidently have interesting meetings in the south! Anyway, Mr. Anderson evidently impressed the reporter, for we read that: 'Hearty applause greeted a well-balanced and erudite lecture, delivered entirely without notes, by a speaker evidently an expert in all geological matters.' All we can say is that if Mr. Anderson's conclusions are correct, he has found, in flint, remains of

animals which ought to have been dead millions of years before the formation of the Chalk Sea !

FORMER LEEDS PROFESSOR HONOURED.

Reuter announces that the Royal Academy of Science, Stockholm, has awarded the Nobel Prize for Chemistry for 1915 to Professor A. R. Willstäetter, of Berlin, and that the prize for Physics should be divided between Professor W. H. Bragg, formerly of Leeds, and his son, W. L. Bragg, of Cambridge, ' for examination of the formation of crystals by X-rays.' This announcement gives great satisfaction in Leeds, for until September last the Professor was Cavendish Professor of Physics at the University of Leeds, where he carried out a good deal of that research work into the formation of crystals by X-rays, which has gained for him and his son their signal honour. The Professor now occupies the Quain Chair of Physics in London University. His son is at present in France as an officer in the Leicestershire Royal Horse Artillery (Territorials). The value of the Nobel Prize is £8,000.

A SKELETON OF ELEPHAS ANTIQUUS.

At a recent meeting of the London Geological Society, Dr. C. W. Andrews, F.R.S., gave an account of the discovery and excavation of a very large specimen of *Elephas antiquus* near Chatham. The specimen was originally discovered about three years ago by a party of sappers who were digging a trench. The attention of the British Museum was drawn to this find by Mr. S. Turner, of Luton, Chatham. The extraction of the bones was delayed until the past summer. A great part of the skeleton has now been collected, owing largely to the skill of Mr. L. E. Parsons, Junr. The skull, unfortunately, was in a very bad condition, but two complete upper and one lower second molars were obtained. One tusk, about 7 or 8 feet long, was also found. The lower ends of both femora were destroyed in the original trench, but of the other limb-bones, nearly complete specimens from one or both sides have been obtained, as well as a sufficiently large series of bones of the feet to allow of their reconstruction. Many vertebræ were also collected. The animal, which was adult, must have been of very large size, having stood about fifteen feet at the highest part of the back, or more than three-and-a-half feet higher than the large African Elephant mounted in the Entrance Hall of the Natural History Museum. The molar teeth show conclusively that the species represented is *Elephas antiquus*, and from the thickness of the enamel and some other characters, it may be inferred that the animal was probably of a type as early as, or earlier than, that found at Grays. It is the first British example of this species in which the skeleton has been found directly associated with the teeth.

A YORKSHIRE DENE HOLE.

T. SHEPPARD, M.Sc., F.G.S.

THE Hull Corporation has recently purchased what is known as the Cottingham Castle Estate* at Cottingham, near Hull, for the purpose of a sanatorium. With the object of obtaining chalk for the roads, a disused chalk quarry on the hill top near the road leading from Willerby to Skidby was opened out.

When the rubbish which covered the old quarry face had been cleared away, the entrance to a cave was found at a depth of 13 feet from the surface. This was 5 feet high, the floor of the cave being 18 feet deep. At the entrance was a heap of chalk rubbish, which had accumulated in it some time previously. It is necessary to scramble down this before reaching the level floor, which is a distance of about 40 feet from the entrance, and at a depth of 7 feet below the quarry, or approximately 25 feet from the surface of the ground.

This entrance tunnel varies from 5 feet to 6½ feet in width, and is 9 feet 9 inches high. It then bifurcates, the two branches meeting again at a distance of about 40 feet, and from this tunnel three shafts are driven in different directions. The tunnel and shafts vary from 4 feet to 6 feet in width.

Over most of the excavation there is a fairly thick bed of hard chalk, forming a roof, which is about 15 feet below the surface of the ground. Nothing was found in the excavation beyond some branches of trees and pieces of wood, which, however, were quite rotten, and almost fell to dust on being touched.

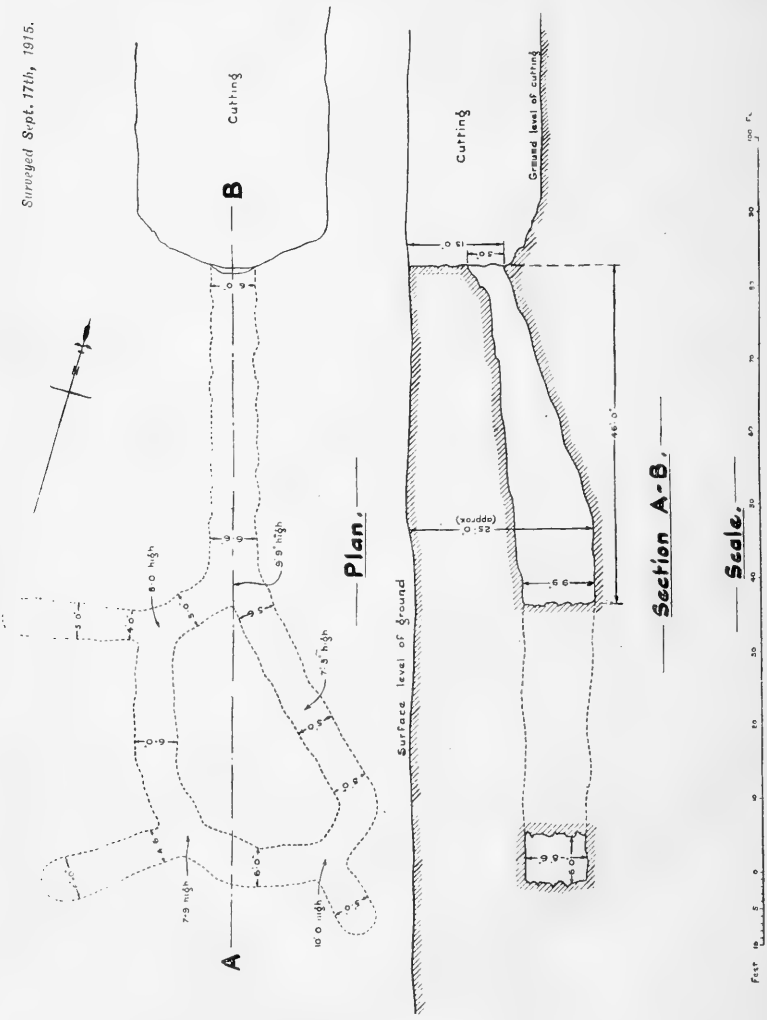
In different places the chalk has been blacked by lamps or candles, and various signatures of earlier visitors, dating from 1848 to 1854, occurred.

On looking at the section outside the entrance there is a bed, 9 feet or over, of reddish boulder clay (Hessle Clay), containing few pebbles, mostly of chalk. Occasionally a Lake District Andesite or Carboniferous sandstone occurred. The clay is blue-jointed, but is remarkable for its great thickness at its position at the top of the hill. Below the clay is a bed of rubble or grut, about a foot in thickness, composed of sand and chalk mixed together. This is very hard, and has to be removed by crowbar and pickaxe.

Below this for three or four feet the chalk is much crushed and ground by the action of the moving ice which deposited the boulder clay. Below this again the chalk is fairly hard and in beds about a foot in thickness, with here and there a band of

*This must not be confused with the old Cottingham Castle of the Wake family, which was within the village itself.

flint 3 inches to 5 inches in thickness, and interspersed among the chalk are nodules of flint, in many cases obviously formed around sponges. The chalk contains few fossils.



Plan and Section of Dene Hole, near Cottingham, East Yorks.

At the present time an enormous quantity of clay has to be removed and carried away before the chalk can be quarried.

It is fairly obvious that the cave was made in the form of a tunnel in order to extract as much chalk as possible without removing the mass of clay which covered it. With regard to

the origin of the excavation, I am informed by Mr. Witty, of Cottingham, that his father, who was agent for the late Thomas Thompson, the former owner of Cottingham Castle estate, had given him an account of it.

It seems that in the winter of 1812, in order to relieve local distress, Mr. Thompson employed a number of men to excavate this chalk for the purpose of repairing his roads, etc., and there seems to be no reason to question this statement, though the various local rumours in regard to the origin of this cave are both extensive and peculiar.

The most interesting fact with regard to the find, however, seems to be that this is the first example in Yorkshire of chalk being quarried in this underground manner, after the plan of the well-known 'dene holes' of the south-east of England. All our Yorkshire chalk quarries are made on the surface, and, of course, some of them go to an enormous depth. A recent visitor to the quarry, who is now 82 years of age, remembers playing in it as a boy of ten. It is marked on the old ordnance plan as a 'cave.'

I am much indebted to the City Engineer at Hull for the accompanying plan and section, which he kindly made at my suggestion.

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The *Zoological Society of London* has issued a valuable handbook entitled 'Practical Advice on the Fly Question' which is sold at the extremely low price of 1d.

Old-Lore Miscellany, Vol. VIII., part 3, has been issued by the Viking Society, and includes an article on 'A Tour through Orkney in 1778,' by the Rev. George Low. This includes some interesting botanical notes.

We learn from *The Brighton and Hove Graphic* that a party of naturalists recently paid a pilgrimage to the grave of Richard Jefferies. It is reported that 'the pilgrims numbered some twenty *odd* ladies and gentlemen.' A photograph of the party is given, but some of the 'odd' ladies, at any rate, look quite charming !

From Mr. Joseph W. Gray we have received some valuable notes on 'The Pleistocene Geology of the Area around Worcester,' reprinted from the *Proceedings of the Worcestershire Naturalists' Club*. It is interesting to notice how far afield Mr. Gray has gone in order to account for the glacial conditions in the Worcester district.

The Proceedings of the Geologists' Association, Vol. XXVI., part 3, contain an interesting paper on 'The Structure of the Eastern Part of the Lake District,' by J. F. N. Green. It is illustrated by some coloured sections. The same publication has a lengthy account of 'The Geology of the Glasgow District,' by Prof. J. W. Gregory and others.

The Quarterly Journal of the Geological Society, No. 281, contains the following papers of interest to our readers:—Dr. A. Vaughan on the Correlation of Dinantian and Avonian; Mr. C. T. Trechmann on the Scandinavian Drift of the Durham Coast and the General Glaciology of South East Durham; Mr. C. Dawson and Dr. A. Smith Woodward on a Bone Implement from Piltdown, Sussex.

NOTES ON THE FLORA OF ESKDALE AND WASDALE.

JOSEPH F. Y PICKARD.

I WAS at Boot, South-West Cumberland, towards the latter end of August of this year, and found that the flora of the district gave ample room for investigation. The absence of a lake in the immediate valley of the River Esk, together with some degree of inaccessibility, has had considerable effect in checking the rush of tourists to its solitudes, in the season when most other portions of the Lake country are besieged with visitors. During the nine days I stayed there I noted upwards of three-hundred wild flowers, grasses and ferns in the neighbourhood. I examined the country extending from the sand dunes at Drigg and Ravenglass across the comparatively flat lands of the Lower Esk and Irt, and up the windings of these rivers to the heart of the hills; Wastwater, the western slopes and summit of Scawfell, and the heads of the dales themselves; with observations around the shores of numerous small tarns and drying up pools, and their associated bogland, situated among the fells. I have consulted principally the late Wm. Hodgson's 'Flora of Cumberland,' as to the comparative rarity of some of my finds, and have also had access to Mr. J. G. Baker's 'Flora of the Lake District.'

The presence of granite together with the slate in the soil, and the harder volcanic ash of the Scawfell heights, assist the variety of plant life, while the thorough wildness of most of the woodland, in the higher valleys and adjacent becks afford shelter for rare species. One of the most important plants observed was *Vicia Orobus*, which is a confirmatory record. It is mentioned in the appendix of Hodgson's Flora as having been found some years ago here, by Mr. Harold Adair, of Whitehaven, who wrote me in October, 1913, to say he was afraid it was an error owing to too hasty examination. I found it in good fruit, and it must be reckoned not only as a new divisional record, but one of the rarest plants in the north of England, so Mr. Adair is to be congratulated on his discovery.

Another interesting plant is *Tilia cordata* (*parvifolia*), which was growing practically out of rocks at the foot of Hardknot Pass, and by Whillan Beck near Boot. It is in a flourishing condition, and looks quite native. It is not recorded in Hodgson's Flora, and Mr. Baker mentions it as a denizen for one locality, Borrowdale.

On the Dunes between Drigg and Seascale, I noticed a form of *Viola Curtisii* in some plenty, probably to be

associated with the variety *Pescanii* Lloyd, found on Walney Isle, if not new to Cumberland, at least unrecorded for the South-West Division.

At Wasdale Head in pools difficult of access, owing to immediate bog, and their depth, if I am not very much mistaken occurs *Ceratophyllum aquaticum* (the hornwort), another addition to the County Flora, though needing further confirmation to place the variety on record. For this, good fruit is required.

The upper portion of the Esk from Yeastyrigg Crags under Bowfell, to Boot village, is for the most part very wild, native scrub abounds of oak, mountain ash, holly, *Prunus Padus*, birch, and hazel, which diminish in quantity as the valley becomes narrower. The undermentioned plants were observed in the upper portion of the river area, either in the valley itself, or in its immediate neighbourhood :—

Hypericum Androsæmum, Geranium sylvaticum, Cytisus, Corydalis, Sedum anglicum, Sanicula, Myrrhis, Carlina, Jasione, Anagallis tenella, Empetrum, Juniperus, Rhynchospora alba, Polypodium Phegopteris, and the four less rare Lycopodiums. The comparative dryness of the stony slopes may explain the absence of *Polypodium Dryopteris*. I also noticed *Hymenophyllum unilaterale* only in one place, Dale Garth Force, where it was abundant. *Myrica Gale*, one of the most characteristic of the Bogland species, was to be found extending from 1,500 feet almost to sea level. *Osmunda*, where some protection is afforded it, grows to a large size, but in the open country it is becoming very rare ; the time is past when the Eskdale farmers used it to protect their potato carts on the way to Whitehaven market.

As we descend the Dale the flora changes, and a few plants occur which are absent higher up. *Stellaria nemorum*, in the boggy woods, *Potentilla procumbens* on dry banks at Eskdale Green, and where Muncaster and Irton Parks border the lanes, *Spiraea salicifolia* and *Berberis* are established in hedges. The luxuriant growths of the planted trees near Santon Bridge and the foot of Wastwater, add greatly to the grand scenery, and the profusion of *Erica cinerea* and *Ulex Gallii*, a mass of purple and gold over the red granite rocks as a foreground, with the peaks and crags around the shores of the lake, especially at sunset, must be seen to be fully appreciated. *Lysimachia Nummularia, Lepidium Smithii* and *Sedum Fabaria* grow in the vicinity, while lower down and nearer the sea, *Galium mollugo* was found, a rather unusual occurrence, off limestone. *Geranium sanguineum*, and *Convolvulus Soldanella* were noticed near Seascale, and *Bidens tripartita* in the ditches near the shore at Drigg. On the north-west shores of Wastwater many sub-alpine aquatics are to be found, while

the very local *Lycopodium inundatum* is plentiful in stony bogs, *Ranunculus Flammula* variety *pseudo-reptans* is found and *Drosera intermedia* grows with the round-leaved species. *Potentilla fruticosa* grows in Devil's Sledgate, a ravine of the Screes, and is reported from near Ulpha, which locality may possibly be in Lake Lancashire.

I found a large quantity of *Stachys ambigua*, a well-known hybrid, in one locality near Boot, and a form of one of its parents *Stachys palustris*, with paler flowers, affecting dryer ground than the usual ditch loving form, in the same vicinity.

The slopes of Scawfell were too dry, above 2,000 feet, for Alpines, though small specimens of *Saxifraga stellaris* occurred as high as 3,000 feet. This and *S. aizoides* were the only two species observed in the district. *Oxyria reniformis*, and dwarfed *Alchemilla alpina* occurred, while according to Rev. E. S. Marshall, the rare form of *Deschampsia cæspitosa* var. *alpinus* = var. *brevifolia* was found at 2,400 feet. Two Euphrasias also examined by him are *E. Rostoviana* and *E. stricta* from Wasdale Head. One feature was the abundance on Scawfell's summit ridge at 2,600 feet, of *Vaccinium Vitis-idæa*, barren examples only, an inch or two in height, with rather narrower leaves than usual and more pointed, though evergreen, suggesting at first sight the Arctic Willow which occurs under similar conditions on Scawfell Pike and Helvellyn. Parsley Fern descends to Boot village at 300 feet, and is reported from Black Combe at nearer sea level.

Mention must be made of the mountain tarns, where many interesting species occur, and especially of Birker Tarn, a mere pool under Green Crag and east of the road from Boot to Ulpha. Its elevation is about 900 feet. It contains *Menyanthes, Phragmites, Equisetum limosum, Sparganium affine*, while *S. minimum* and one or two Carices grow in the stream watering it from the moss. *Isoëtes, Littorella lacustris*, and *Lobelia* all occur here, and in many other tarns, and I have little doubt some still more valuable discoveries might be made rather earlier in the season.

Two solitary Yews, old trees, can be seen high up the Esk Valley, reminders of the famed Seathwaite, Borrowdale, and Duddon examples, the three localities in practically a straight line from north to south.

When in Eskdale on this occasion I was unaware that Mr. Percy H. Grimshaw contributed some 'notes' on this very district to *The Naturalist* of Nov. 1890. His observations were wholly made, however, in early June, with the result that many species he saw were 'over' when I was there; per contra, many of those I noted, being late or autumnal in their maturing, may fairly be regarded as usefully supplemental to the already published very full list.

THE GUESTS OF YORKSHIRE ANTS.

T. STAINFORTH, B.A., B.Sc.

Of the various *modi vivendi* adopted by our indigenous insect fauna, none is more interesting than that of inhabiting ants' nests as welcome or unwelcome guests. Between seventy and eighty species of British Coleoptera, besides other classes of animals, have been recorded from ants' nests, and, while in many instances the relationship is purely accidental, in the greater number of cases there is an actual association between the beetle and the ant. This association may be one of friendliness, toleration, or hostility; and though these relationships merge into one another, it is possible to classify our myrmecophilous fauna under three main heads: (1) true guests, (2) indifferently tolerated tenants, and (3) actively pursued tenants. These are respectively the symphiles, synoeketes, and synechthrans of Wasmann, who also particularises parasites (ento- and ecto-), and trophobionts or food-producing animals of the ants.*

True Guests.—In our British beetle fauna six species occur under such conditions that they may be considered as true and welcomed guests, or symphiles, in the nests of various ant species, viz.:—*Lomechusa strumosa* F., *Atemeles emarginatus* Pk., *A. paradoxus* Gr., *Claviger testaceus* Preys., *C. longicornis* Müll., *Amphotis marginata* F.

Of these, only one species, *Atemeles emarginatus*, has hitherto been recorded for Yorkshire, and to this may now be added *Claviger testaceus* (*foveolatus* Müll.). This latter species, perhaps the most interesting of our myrmecophilous insects, I found at Robin Hood's Bay in September, 1911, when I secured two examples on the underside of a half-embedded boulder forming the roof to a nest of a colony of the Yellow Ant, *Donisthorpea* (*Lasius*) *flava*.

The Clavigers are in structure remarkable among beetles. Their mite-like form, small size (2 mm.), thick antennae, and abdomen furnished with a peculiar depression and tufts of yellow hairs, render them easily recognisable. *C. testaceus* is rarely found elsewhere than within the nest of a species of *Donisthorpea* usually *D. flava*, but occasionally *D. aliena* or *D. nigra*. Our two British Clavigers are probably the most specialised of our indigenous coleoptera for a myrmecophilous life. They are blind, fed as a rule by their hosts (but Donisthorpe and Prof. Hetschko have proved experimentally that they are capable of feeding themselves on the larvæ of ants

* See 'The Ants and their Guests,' P. E. Wasmann, Smithsonian Rep., 1912, pp. 455-474; and 'Ants, their Structure, Development and Behavior,' W. M. Wheeler, Columbia Univ. Biol. Ser. IX., 1910, p. 380.

and on dead flies), and secrete from the abdominal hair-tufts a sweet substance, to ants both palatable and stimulating.

C. testaceus has been taken in many places in the south and west of England, as in the Isle of Wight, Somerset, Oxford and N. Wales; and in north, in the Tweed and Forth districts. Its discovery in the intervening area of Yorkshire could thus have been prophesied, and careful search in nests of *Donisthorpea* spp., will probably prove its occurrence in other districts in Yorkshire. I regret that a search during the present year in numerous nests of *D. flava*, in Holderness and the Wolds district of the East Riding, has had a negative result, but I have not yet given up hope of finding it there.

Atemeles emarginatus, the remaining true ant-guest recorded for Yorkshire, has been found near Doncaster. This is apparently the northernmost record, as Fowler* says he knows 'of no locality further north than Lincoln,' where he took it with *Formica fusca*. It is possible that this species is extending its range northward, and if so we may be hearing of its occurrence in other parts of the county. I have not been successful in my search for it in the Hull district, which unfortunately, is somewhat out of the main stream of migration from the south.

The remaining four British symphiles have a southerly distribution, and unless a northward spread of the species takes place before the increase of coal mines and the greater extension of agricultural and industrial areas raise an insuperable barrier to their advance, it is scarcely probable that these will ever become Yorkshire species. I have shown on the accompanying sketch maps the relative distribution of the six British true ant-guest beetles. It should be added that *Claviger longicornis* has only recently been added to the British list on the authority of specimens captured near Oxford by Commander Walker in 1906.

We may, perhaps, include among true guests, the species of aphides which are the normal inhabitants in the nests of many ant species, such as *D. flava*. I found aphides in abundance in the nests of this ant at Weedley, and submitted specimens to Prof. F. V. Theobald who kindly informs me that they are the ground form of the Elm Gall Aphid *Tetraneura ulmi*. These occurred, clustered round the grass roots which penetrate the tunnels of the nest, in company with groups of ants.

INDIFFERENTLY TOLERATED TENANTS.—Of the 'indifferently tolerated tenants' (synoeketes), or, in Donisthorpe's phrase, 'indifferently treated lodgers,'† several have been

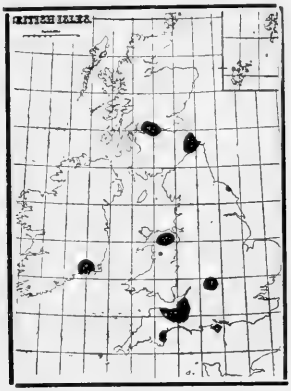
* Coleoptera of the Brit. Isles, vol. II., 1888.

† See 'The Myrmecophilous Coleoptera of Great Britain,' by H. St. J. K. Donisthorpe, Col. Brit. Isles, vol. VI., 1913, pp. 320-330; and Rep. of the Lancs. and Ches. Ent. Soc., for 1905, pp. 35-44.

Lomechusa strumosa.

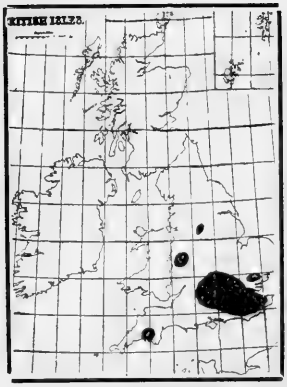
Atemeles emarginatus.

Atemeles paradoxus.



Claviger testaceus.

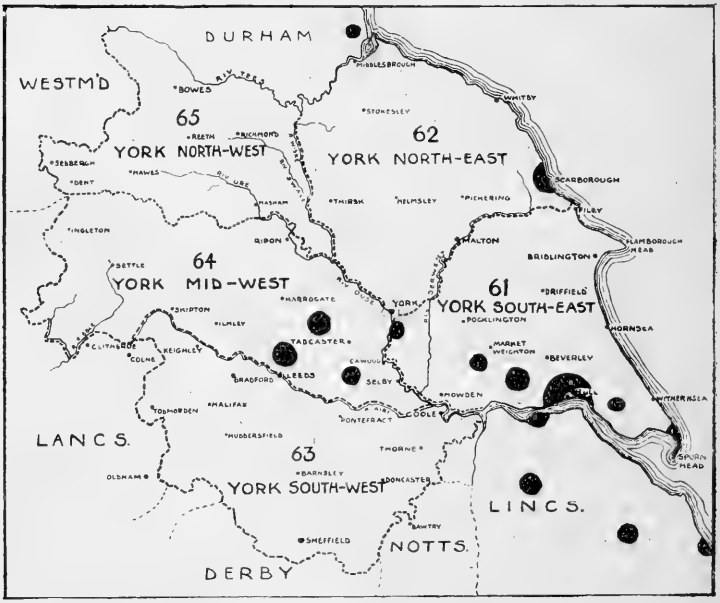
Claviger longicornis.



Amphotis marginata.

recorded for the county. In this division are included beetles, etc., more or less immune from harm owing either to their activity, small size, hard integument, or some other property, which causes ants to look upon them with indifference.

One of the commonest examples of these, at any rate in East Yorkshire, is the small white woodlouse (Isopod) bearing the name of *Platyarthrus hoffmannseggii* Brandt. I have found this animal during the past year occurring abundantly



The ascertained distribution of Platyarthrus in Yorkshire and bordering areas.

in the nests of various ant species in many parts of the East Riding, as at Weedley, near South Cave, in the nests of *Formica fusca, Donisthorpea flava,* species of *Myrmica* and *D. nigra*; near Hull and at Kelsey Hill in Holderness with *D. flava* and *Myrmica*; Hessle Chalk Quarries in nests of *Myrmica*; in the Lias pits at North Cave with *F. fusca, D. flava,* and *D. nigra*; and at Holme-on-Spalding-Moor with *Myrmica laevinodis* and *D. flava.* It is also recorded* for Spurn, Scarborough, Barnscliffe, Monk Friston, and Adel Moor (near Leeds). Stan-

* *The Naturalist,* 1910, pp. 176, 203, 376.

den* records it from Linton and Wetherby, and Stebbing† from Naburn, near York. In Lincolnshire it occurs at South Ferriby where I found it on October 16th, with *D. nigra* and *F. fusca*, and at Cadney, Louth, Mablethorpe and Willoughby. In a paper on 'The Distribution and Habits of *Platyarthrus hoffmanseggii* Brandt., with special reference to West Lancashire,' Standen‡ writes that in his experience the nest of *Donisthorpea flava* is its principal habitat, and that he can only find one solitary record of its occurrence with another species, viz., *Myrmica rubra*. This is difficult to understand seeing that the discoverer of the species in England, the Rev. A. R. Hogan,§ observed it near Weymouth 'in as many as thirty nests of the common red, yellow and black ants. Donisthorpe‖ records it for *F. rufa, fusca* and *sanguinea, D. flava, fuliginosa, nigra, umbrata* and *aliena, Myrmica scabrinodis, laevinodis,* and *sulcinodis*; while Wasmann¶ records it on the Continent for an even greater number of species.

My own experience coincides with this, as I have found it occurring indifferently in the nests of all the ant species I have yet observed in the East Riding. Near Weedley Springs, where at least four species live in proximity to one another, the isopods occurred freely with each, but I think in the greatest abundance in the nests of *F. fusca* where they offered a pronounced contrast in colour and movement to this dark and active ant.

Every observer is struck by the obvious impunity with which the little unarmed crustacean walks among the crowded ants. I have never seen an ant take the slightest notice of it. A Platyarthrus's one desire seems to be to escape from the light, and although its movements are comparatively slow it is remarkable how soon it 'makes itself scarce' by disappearing into the innermost recesses of the nest. Specimens may be taken from the nest of one ant species to another and still the same mutual indifference is, in my experience, to be observed. If the ants, however, are similarly transported there is bound to be trouble.

A nest of *D. flava*, consisting, as it does, of a complicated ramification of tunnels, affords a very suitable retreat for many small subterranean animals besides the one just described. A week ago (October 23rd), I came across a mound

* *The Lancashire Naturalist*, Nov., 1909, pp. 239-242.
† Vict. County Hist. Yorks., I., p. 312.
‡ *loc. cit.*
§ Nat. Hist. Rev. VI., p. 109; and Bate and Westwood, 'Brit. Sess. Eyed Crustacea,' vol. II., p. 465.
‖ Ent. Rec., 1902, p. 70; and 'British Ants,' 1915.
¶ 'Die Gäste der Ameisen und Termiten,' 1898.

nest of this species at Kelsey Hill, in Holderness, which measured about three feet by two and half feet, and about a foot in depth through the tunnelled portion. I made as careful a calculation as the circumstances would permit and arrived at the result that there would be about 2,300 feet of tunnels in the nest. This particular example abounded in various subterranean animals, all of them resembling *Platyarthrus* in being of a pure white colour, and some like this animal also belonging to the group of 'indifferently tolerated tenants.' Besides *Platyarthrus*, there was the active little blind 'springtail' (Collembolan), *Cyphoderus albinos* Nic. (also called *Beckia albinos* by Lubbock in his 'Ants, Bees and Wasps'); the 'bristletail' (Thysanuran), *Campodea staphylinus*, and *Scutigerella immaculata*, one of the Symphyla.

Exactly the same association occurred in the nests of *D. flava* at Weedley Springs, on the Wolds, with the addition, however, of a white 'springtail' I have not yet been able to identify. I have carefully compared the *Scutigerella* from Weedley with the descriptions in Bagnall's valuable 'Synopsis of the British Symphyla,'* and it is certainly *immaculata*. I am hoping that among material still to examine there may be other species. Almost the same association is to be found in Scandinavia, for Schott, writing of *Cyphoderus albinos*, says that he has found it 'recht oft auf . . . . . Streifzügen in nördlichen Upland, dann immer unter Steinen zusammen mit *Scolopendrella immaculata, Campodea staphylinus* und einer roten Ameisen-Art.'† *Platyarthrus* is not mentioned. Whether the isopod occurs in Scandinavia or not I am unable to say. At any rate it is not represented there in Scharff's map of the geographical distribution of *P. hoffmannseggi*, given in his 'European Animals' (1905), although it is shown to occur in Denmark.

Leaving aside *Platyarthrus*, of these subterranean animals *Cyphoderus* is the only true myrmecophile, inasmuch as it is consistently found only in association with ants. It probably occurs throughout the county. I have always found it when I have searched specially for it in the East Riding, usually with *Donisthorpea flava*, as at Weedley, Kelsey Hill, and North Cave, but also with *Leptothorax acervorum* at Holme-on-Spalding-Moor, and with *Formica fusca* at South Cave. Bagnall‡ says it

* Trans. Nat. Hist. Soc. N., D., and N.C. (N.S.), vol. IV., part 1, pp. 17-41.

† 'Frequently on expeditions in northern Upland, and always under stones, together with *Scolopendrella immaculata* and *S. staphylinus* and a red ant species.' 'Zur Systematik der Collembola,' Kongl. Sv. Vet. Akad. Handl., Bd. 25, II., 1892, No. 11, p. 44.

‡ 'Short Notes on Some New and Rare British Collembola,' Trans. Nat. Hist. Soc., N., D., and N.C., (N.S.), vol. III., part 2, 1909, p. 504.

is common wherever he has searched for it in Northumberland and Durham. The species is widely distributed throughout Europe and occurs even in North America. Its association with ants seems to have been recorded very early, as Tullberg,* writing of the species, says that O. Fabricius (1783) found it in Norway 'under stenar tillsammans med röda myran.'† *Cyphodcrus* is a bustling little beast and difficult to catch, even with a camel hair brush and a tube of alcohol, as he quickly disappears out of sight. This horror of light he holds in common with all his white subterranean associates.

Campodea staphylinus is abundant everywhere in dampish places, under stones, under pots in greenhouses, among decaying vegetation, etc. The name, however, as used here, probably covers a number of species; as Bagnall, who is now working at the Campodeidae, has already demonstrated that several closely allied Campodeas exist in the north of England.

Scutigerella spp. are also similarly distributed. Under the name *immaculata* have been included several closely allied species. It is of course, possible that certain forms of *Campodea* and of the Symphyla may be normally associated with ants. I have found *Scutigerella* together with Campodeas and *D. flava* at Kelsey Hill, Weedley, North Cave, and Holme-on-Spalding-Moor. At South Ferriby, in North Lincolnshire, the same association is to be found not only with *D. flava* but also with *D. nigra*.

In the mounds of *D. flava* at Weedley I noted the abundance of two species of earthworm. The Rev. Hilderic Friend, to whom I sent them, tells me they are the Green Worm, *Allolobophora chloritica* and the Mucous Worm, *A. mucosa* (*Eisenia rosea*). There were also a number of Diplopoda which I have not yet had determined.

About twenty-five beetles of the 'indifferently treated lodger' class have been recorded for Britain, and of these the following eleven species have so far been noted in Yorkshire:—

Microglossa pulla Gyll., Scarborough, Studley, West Ayton, Wetherby.

Oxypoda formiceticola Märk., Scarborough.

O. haemorrhoa Sahl., Scarborough.

Dinarda märkeli Kies., Scarborough.

Homalota parallela Man., Scarborough.

Batrisus venustus Reich., Studley.

Trichonyx märkeli Aub., Scarborough.

Ptilium myrmecophilum All., Scarborough.

Myrmetes piceus Pk., Scarborough, York.

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* 'Sveriges Podurider,' Kongl. Sv. Vet. Akad. Handl., Bd. 10, 1871, No. 10, p. 38.

† 'Under stones, together with red ants.'

Monotoma conicollis Aub., Scarborough, York.
M. formicetorum Th., Scarborough, York.*

Seven of these occur exclusively with the Wood Ant, *Formica rufa*. As I have yet to see the first nest of this species in the East Riding, my search in this particular area has not yet been very successful. I was delighted, however, on visiting Weedley with Mr. E. Bilton, on September 5th, to discover a specimen of the interesting Pselaphid, *Trichonyx märkeli*. This occurred in a nest of *D. flava*. Besides being the first record for the East Riding, it is the second for the whole county. It has been previously found at Scarborough, about fifty years ago.

Of the remaining British beetles of this class, several have a distribution south and north of the county, and therefore should occur in Yorkshire. For example, *Oxypoda vittata* has been found with *D. fuliginosa* in the south, the midlands, Scotland and Ireland. The five species immediately following occur with *F. rufa*. Of these, *Oxypoda recondita* occurs in the south, Leicestershire, and Scotland; *Scydmaenus godarti* as far north as Sherwood Forest and Manchester; *Ptenidium myrmecophilum* in the Northumberland district as well as in the south; *P. kraatzi* as far north as Leicestershire, and is also said to occur at Rannoch; and *Dendrophilus pygmaeus* in the south, Northumberland district and Scotland.

Six or seven beetles of this class are of a strictly southern distribution. In a thickly populated, highly cultivated and industrial area as England, it is only remotely possible that these will ever spread as far north as Yorkshire, but will persist as more or less isolated colonies.

Among the 'indifferently tolerated lodgers' are included a few spiders. The best known type is *Thyreosthenius biovatus* Camb., which lives in the nests of *Formica rufa*. Mr. W. Falconer has taken it at Danby Dale, near Huddersfield, and it will probably be found wherever the host ant occurs. It is a

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* It will be noticed that many of these records are for the Scarborough district. They are based on a brief note by T. Wilkinson, of Scarborough, which appeared in the *Entomologist's Monthly Magazine* for June, 1865, page 14. As this early number is not so easily accessible, it may be worth while reprinting the paragraph referred to, which is as follows:—

'ANTS' NEST BEETLES AT SCARBOROUGH.—On the 28th April, I made my first essay at examining some nests of *Formica rufa*, which are plentiful in woods near this place, and soon found several specimens of their beetle tenants, some of which were in abundance. I send a list of their names, thinking it may be of interest to some of the readers of *The Entomologist's Monthly Magazine*, as showing the northern prevalence of our southern forms. *Thiasophila angulata, Dinarda Markellii, Oxypoda formiceticola, Oxypoda haemorrhoa, Homalota flavipes, Homalota anceps, Homalota parallela, Leptacinus formicetorum, Monotoma angusticollis.* I also met with other species which are not peculiarly ants' nest beetles.'

common species not only in the south, but also in the northernmost counties of England. *Evansia moerens* Camb., another spider of this class, has been found in the Huddersfield district, Cleveland district, and at Redcar. It usually occurs with the host species, *D. nigra* and *F. fusca*. *Tetrilus arietinus* Thor. and *Cryphocca diversa* Camb. are two myrmecophilous spiders which may possibly be found in Yorkshire. The former associates with *F. rufa* and *D. fuliginosa*, and has been captured at Oxshott (Surrey), and in Wales. The type female of *Cryphoeca diversa* was taken at Carlisle, and the species has also occurred at Oxshott and in Berkshire. The host ant is *Formica rufa*.

Hostile Persecuted Lodgers.—The third class includes the unwelcome guests, the 'hostile persecuted lodgers.' About two dozen British species live by their wits or by superior strength at the expense of ants, and eleven of these have up to the present been observed in Yorkshire. These are:—

Atëochara ruficornis Gr., Studley, Copgrove, Scarborough and Saltburn.

Thiasophila angulata Er., Scarborough, York.

Myrmedonia humeralis Gr., Scarborough.

Drusilla canaliculata F., common generally.

Notothecta flavipes Gr., Scarborough.

N. anceps Er., Scarborough.

Lamprinus saginatus Gr., Scarborough.

Quedius brevis Er., Scarborough.

Leptacinus formicetorum Märk., York, Scarborough, Doncaster.

Othius myrmecophilus Kies., Filey, Scarborough, Hackness, Saltburn, Ingleton, Stanghow Moor, Hutton Moor, Lunedale and Edlington.

Clythra quadripunctata L., Scarborough, Kirkstall Woods and Wentbridge.

Drusilla canaliculata I have captured on many occasions during the year, invariably in the neighbourhood of an ant colony, as at Hessle, Kelsey Hill, South Cave and North Cave. It appears to have a preference for species of *Myrmica*, but one example occurred near a nest of *D. flava*. Dr. W. J. Fordham informs me that *F. rufa* occurs at Wentbridge, whence he has a specimen of *Clythra*.

Of the remaining thirteen beetles in this group, ten are rigidly southern species, and there is only likelihood of three being eventually discovered in Yorkshire. These are *Myrmedonia collaris* Pk., found with ants of the genus *Myrmica* in the south and south-east, in Leicestershire and in the Tweed district; *Myrmedonia limbata* Pk., found in the south, in Lincolnshire, and in the Northumberland district and Scotland; and *Xantholinus atratus*. Heer., found chiefly in the

south, but occurring in Leicestershire and near Liverpool. In one case, that of the rare *Myrmaecia plicata* Er., the ant host, *Tapinoma erraticum* does not occur in Yorkshire, any chance of finding the guest being thus precluded.

A number of spiders may be placed in this class, except that the phrase 'hostile persecuted lodgers' should rather be 'hostile persecuting lodgers.' *Micariosoma festivum* C.K., occurs with *F. rufa, F. sanguinea, F. fusca, Donisthorpea fuliginosa, D. nigra* and *D. brunnea.* On October 16th I came across dozens of immature examples (identified by Mr. W. Falconer) of both sexes in a chalk quarry at South Ferriby in North Lincolnshire in a nest of *D. nigra,* within sight of the Yorkshire shore. It seems to have been taken only once in the county, Mr. W. P. Winter recording it for Wilsden.* By some, this spider is not looked upon as a true myrmecophile, but I feel confident from my own observation that Donisthorpe's† estimation of the relationship between this spider and the ants, near or with which it is found, is the correct one. The examples at South Ferriby were mingled with the ants, and were not at all dissimiliar to them in appearance.

Hahnia helveola E.S., also occurs in association with a species of ant, *D. fuliginosa,* and has been taken in the Huddersfield and Bradford districts. An association of *Harpactes hombergi* Scp., with the same ant has been noted by Wasmann and Donisthorpe. It has also occurred with *Formica fusca.* I have taken this spider fairly frequently during the year in various parts of the county as at Selby, Hessle, Hornsea, Houghton Woods, and Holme-on-Spalding-Moor, but on no occasion have observed any close association with ants. This species appears to be uniformly distributed throughout the county in suitable places. *Syedra innotabilis* Camb. and *Microneta viaria* Bl.,are said to occur with *F. rufa* and *D. fuliginosa,* the former apparently being only recorded for Skelton in the north-east of the county, while the latter is widely distributed in Yorkshire, and has occurred in Holderness, the Wolds district, Scarborough, Huddersfield and Leeds. Personally I have not observed any association with ants.

SPIDER, ETC. ANT-MIMICS.—A number of spiders fall into a special class, including species that mimic ants in form and movement. Donisthorpe (*loc. cit.*) says that 'they hunt their prey in the neighbourhood of ants' nests, and are protected from outside enemies by their resemblance to ants.' There is only one common English species which falls under this category, namely *Micaria pulicaria* Saund. On October 17th I took a specimen and observed others in a nest of *D. nigra* at

* 'The Spiders of the Bradford Area,' 1908.

* 'Notes on Myrmecophilous Spiders,' Zool., 1908, p. 423.

South Ferriby, and have noticed the proximity of ants when capturing this species on the Humber shore at Welwick and Saltend Common, near Hull. The species is generally distributed throughout the county. Its resemblance in form and movement to an ant is sufficiently striking as to deceive the unfamiliarised eye, and I personally incline to the view that there is an association between the spider and ants. With the exception of an introduced species found at Kew, there are only two other ant-mimics among our indigenous spiders, and both occur so sparingly in the extreme south that we shall unfortunately never have the pleasure of welcoming them in our Yorkshire fauna.

While on the subject of the mimicry of ants by other animals it is interesting to note that Wasmann considers the beetle, *Clerus* (*Thanasimus*) *formicarius* as an example of true mimicry. This insect, several examples of which were captured in Hull about fifteen years ago, and which has also occurred at York, Scarborough, and Wath-on-Dearne, is in no way a guest in ants' nests.

Doubtfully Myrmecophilous Species.—Quite a number of beetles are recorded whose claim to the title of myrmecophile is doubtful. Donisthorpe* enumerates nineteen species, of which eight have been found in Yorkshire. These are:—*Homalota analis* Gr., *Heterothops nigra*, *Staphylinus stercorarius* Ol., *Leptinus testaceus* Müll., *Trichonyx sulcicollis* Reich., *Ptenidium turgidum* Th., *Abraeus globosus* Hoff., *Corticaria serrata* Pk. I took a specimen of *Staphylinus stercorarius* in a nest of *Myrmica scabrinodis* at Weedley on September 15th. It appeared to be quite at home in the nest.

This capture is more interesting than may appear at first sight. In the 'Zeitschrift für wissenschaftliche Insekten-biologie,' for 1910, is a paper by Wasmann on '*Staphylinus*-Arten als Ameisenräuber' (*Staphylinus* species as Ant-Robbers), which deals fully and especially with the status of *S. stercorarius* as a myrmecophile. His opening paragraph has sufficient bearing upon the occurrence noted above to be worth quoting. He writes: 'Interesting as are the higher stages of adaptation which we find among the normal guests of ants and termites, in both a morphological and a biological sense, we must not on this account overlook the initial stages of adaptation which appear in many so-called "accidental guests." These are often the forms which furnish us with the key to the understanding of the first stages of those processes of adaptation of which we find the complete expression in normal myrmecophiles and termitophiles. Many a one, who has turned his attention to the special study of ants' guests, upon seeing a

* Col. Brit. Isles, VI. p. 330.

Staphylinus stercorarius under a stone in an ants' nest, says with a certain amount of contempt, "Oh, that common fellow is only an accidental guest; he's of no interest to me. The genus *Staphylinus* is not even referred to as a myrmecophile in Wasmann's 'Critical List of Myrmecophilous and Termitophilous Arthropods,' of 1894; therefore I'll let him go." Yet it would be a pity if we did not carefully note down our observations on the occurrence of species of *Staphylinus* in ants' nests. Through my finds in the Grand Duchy of Luxembourg I have come to the conviction that in the case of *Staphylinus stercorarius* especially, and perhaps also for other species in the same genus, we are confronted with a local adaptation towards a robber life in ants' nests, and a commencement of "synechthry."' The writer then goes on to give a critical account of his observations on *Staphylinus* species in the field, and of experiments carried out in observation nests of various ants. He clearly proves that these beetles are able to 'make a living' in ants' nests at the expense of the inhabitants.

Terrestrial isopods occur frequently in ants' nests which they doubtless find to be suitable harbourage, their hard integument rendering them immune from the attentions of the ants. Their occurrence (with the exception of *Platyarthrus*) is, however, doubtless accidental. In the same situation I have also frequently found the Pill Millepede, *Glomeris marginata*. This was especially the case at Weedley.

The symbiotic relationship existing between ants and other arthropod animals is a subtle and far-reaching ecological problem worthy and needy of more attention than has usually been accorded to it in our county. If in this paper the beetles and spiders have been mainly dealt with it is because these particular orders have been more fully studied than others equally important and interesting. It is only by a careful search in ants' nests that many of the rarer of our coleoptera and arachnida can be obtained. It is a subject also which appeals to some extent to the lepidopterist, for among the myrmecophilous symbionts are the caterpillars of some of the Lycaenids which are sought after by ants, who lick them and protect them for the sake of the sweet secretions they supply. The butterfly collector in search of a rare 'blue' finds out first whether the ants are there; if they are, the butterfly may be.* It is quite possible that the scarcity or disappearance of 'blues' in Yorkshire localities has depended upon the scarcity of ants.

It is often difficult to decide whether an animal is truly myrmecophile or whether its occurrence in proximity to a colony of ants is accidental. Most cases can be settled by umerous independent observations and this is work that can

* *See* 'Ent. Rec.' October 1915, p. 217.

easily be done by members of field clubs. It is quite evident that numbers of ant guest species are still awaiting discovery in Yorkshire. The evidence of distribution in other parts of the country leads to this assumption, as does that afforded by a comparison of averages. I estimate that 56 per cent. of the British coleoptera fauna have been recorded for the county, while of the known myrmecophilous forms only 44% have yet been found. At least another 8 per cent. advance should be expected.

As in the case of other insect families, there is evidently a diminution of ant life going on in the British Islands. In the case of ants there is little doubt that game preservation is a potent agent in their destruction, especially in the case of *Formica rufa*, and to this cause, as well as to the non-occurrence of extensive woodlands, I attribute the scarcity of this ant in the East Riding. Some species of ants, however, are able to hold their own fairly well even against very adverse conditions of cultivation. Such are *Donisthorpea flava* and the Myrmicas.

The specimens referred to in this paper have been placed in the collections at the Hull Museum. The nomenclature adopted for ant species is that of Donisthorpe's recent book on 'British Ants.'

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Greek, Etruscan and Roman Bronzes. By **Gisela M. A. Richter, Litt.D.** F'cap, 492 pages. We have always looked upon the publications of the American museums as ideal, in the magnificent way in which they are brought out. The Metropolitan Museum of Art, New York, has recently issued a splendid volume. It contains particulars of nearly two thousand valuable specimens, many of which are figured. It seems remarkable that this comparatively modern museum should possess so many historic and artistic relics relating to these early civilizations.

How to Lay Out Suburban Home Grounds. By **Herbert J. Kellaway.** London: Chapman & Hall, Ltd., 134 pages, 8s. 6d. net. The fact that this work has reached a second edition is some indication of its value. It shows very clearly by the aid of a large number of illustrations, the way in which human habitations may be made picturesque and to harmonize with their surroundings. The author is a professional landscape-architect and lives in Boston, Mass., and all his illustrations are drawn from America. Lists of suitable plants, etc., are given, but these, of course, do not necessarily apply in this country. The price seems sufficient.

Reptiles and Batrachians. By **E. G. Boulenger, F.Z.S.** London: J. M. Dent & Sons, Ltd., 278 pages, 16s. net. The author of this work is the Curator of Lower Vertebrates in the Gardens of the Zoological Society, and consequently has exceptional facilities for studying reptiles and batrachians, which he so ably describes in this volume. The book contains a very useful classification of these animals, and there is much first-hand matter in regard to their habits. The first part of the book deals with Rhynchocephalia, Chelonia (Turtles, Terrapins and Tortoises), Crocodilia (Crocodiles, Alligators, etc.), Lacertilia (Lizards), Ophidia (Snakes), and the second part with Anura (Tailless Batrachians), Urodela (Tailed Batrachians) and Apoda (Limbless Batrachians). A conspicuous feature in the volume is the wealth of illustrations, there being nearly 200, mostly from photographs by W. S. Berridge.

ACARI FROM BIRDS' NESTS,
WITH DESCRIPTION OF A NEW SPECIES.

Rev. J. E. HULL.

In June last, Mr. H. B. Booth of Ben Rhydding kindly sent to me two Tits' nests from which the brood had just flown. Both nests had a fair complement of mites, but the number of species was not above the average. The species were as follows :—

1. **Nest of Coal Tit.**
   - ORIBATIDAE.
     - *Damaeosoma denticulatum* Can., *D. clavipectinatum* Mich., *Tectocepheus velatus* Mich., *Oribates cuspidatus* Mich., *Oribates* sp. n.
   - GAMASIDAE.
     - *Cillibano minor* Berl.
2. **Nest of Blue Tit.**
   - TYROGLYPHIDAE.
     - *Glycyphagus spinipes* Mich., *Aleurobius farinosus* Koch.
   - TROMBIDIIDAE.
     - *Cheyletus eruditus* Koch.

It will be noticed at once that these two assemblages are totally different, so much so that there is not even an overlapping of families. As a matter of fact, the species in the second nest are all of them characteristically fodder-feeders, which may be found at any time in barns, granaries, stables, and similar places ; in the nests of sparrows, starlings, etc., as also in those of rats and mice. I did not, unfortunately, make a note of the materials of which the nest was composed.

The nest of the Coal Tit was largely made of moss, and the mites it contained belong to the group of moss-feeders ; but this is true only in the general sense. The first two on the list, for instance, are not usually found in moss, though they belong to a genus that affects moss more than anything else. There seems to be some curious association between these two species, as I have found them together on several occasions —but always under stones in grassy places, and usually near the sea. I have no record of them from any locality so far inland as Ben Rhydding, or so high above sea level. They are distinctly local species, and their association may be simply a matter of similarity of taste.

Tectocepheus velatus is perhaps more addicted to lichens than to mosses, but is found pretty commonly in both. *Oribates cuspidatus* is a very common species, occurring freely everywhere in moss, lichens, and detritus of all sorts. Of the other *Oribates* I give particulars below.

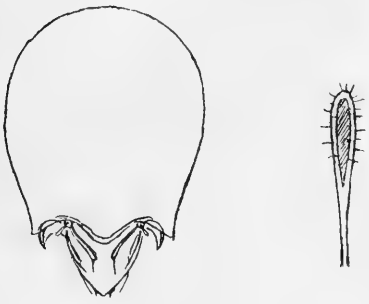
Cillibano minor Berl. is a species not too clearly defined, but the present identification is, I think, reasonably certain. Its usual habitat is among dead leaves, and I have specimens from all the northern counties except Lancashire.

ORIBATES BOOTHIANUS N. SP.

Length, 530μ; greatest breadth, 390μ.

Colour, dark chestnut brown. The cuticle is quite smooth and glossy without any hairs. Chaetotaxy of legs and cephalothorax normal, but the bristles of the latter are shorter and weaker than usual.

Cephalothorax rather short, with well-developed but not large lamellae, converging rapidly forward where they terminate in a very short but acute cusp. Translamella absent. First tectopedia normal, but the second comparatively large. Pseudostigmatic organs erect, short, gradually clavate, the clubbed extremity adorned with short straight bristles. The tarsus has one claw only.



Oribates boothianus.

Body (without legs), and pseudo-stigmatic organ.

I have much pleasure in naming this species in honour of Mr. Booth. It belongs to the monodactyle group of the genus *Oribates* (*Oribata* Michael). Its nearest ally is perhaps *O. furcatus* P.& W., also described from Yorkshire types, by Messrs. Pearce and Warburton (P.Z.S., 1905). It is, however, much smaller than *furcatus*, of which I have examples from Cumberland and Westmorland, and is readily distinguished from all the rest of the group by the erect pectinate pseudostigmatic organs.

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Vol. XV. of **The Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society** have just been received, and are largely occupied by reports of excavations of Roman sites, including a report of the 'Exploration of the Roman Fort at Ambleside,' by Prof. R. G. Collingwood. In this he figures an object described as 'of doubtful use, shaped at one end like a pair of forceps, and having a hole and slot at the other as if to hinge on a transverse metal bar like the beam of a pair of scales. It was found in the commandant's house, room A, lower floor.' We feel sure some mistake must have occurred here as the object is precisely similar to a pastry maker's implement in use in the early part of the last century, the 'hole and slot' described in the Transactions being for the reception of a rivet for a wheel used to decorate the outside of the pastry.

THE PSYLLIDÆ OF THE CLEVELANDS.

J. W. H. HARRISON, B.Sc.

THE following list of the Psyllids of a limited section of the Cleveland area is neither exhaustive nor final, for it compares badly with that for Durham, in which county an equally limited area has been worked. It is hoped, however, that many of the missing species will turn up when districts further afield are worked; there is little prospect of their discovery in the Middlesbrough neighbourhood, as they are chiefly feeders on low plants of which there is but little variety here and, what is more important, those that are present refuse, after persistent working, to yield anything further than the ubiquitous *Trioza urticæ*.

Livia juncorum Latr. A rush feeder distorting rushes in most localities, but curiously local everywhere, sometimes occurring on a single patch of rushes in one field, and apparently absent from what seems an equally suitable bed in the next; also locally plentiful on the moors.

L. crefeldensis Mink. Rare on sedges around an old established pond near Stainton.

Rhinocola ericae Curt. A tiny species not 2 m.m. in length, formerly supposed to be rare but recently proved to be abundant throughout Durham, Northumberland and North Yorkshire, on heather, *Calluna vulgaris*; is especially numerous on Great Ayton Moor where it is dimorphic.

Aphalara calthae Lin. Fairly common on larch and spruce in November, although its food is knotgrass. Marton, etc.

Psyllopsis fraxinicola Först. Everywhere common on ash.

P. fraxini Linn. Almost as common as the last and equally widespread—also on ash.

Psylla pyricola Först. A single specimen beaten from mountain ash, Lonsdale.

P. salicicola Först. Not common, on sallow, Hemlington, Nunthorpe.

P. ambigua Först. Very common on sallow in May and June, Nunthorpe, Marton, etc.

P. hartigii Flor. A few beaten from birch in June, Great Ayton.

P. pineti Flor. Common, beaten from conifers at Eston, Gunnergate and in Lonsdale.

P. melanoneura Först. Common late in the year—not on its reputed food-plant hawthorn—but on oak, conifers, etc. Generally distributed.

P. costalis Flor. Common, obtained from blackthorn, hawthorn, mountain ash, oak, etc., throughout the district.

P. peregrina Först. In multitudes from every hawthorn.

Psylla mali Schm. Not uncommon from crabapple, Gunnergate, Middlesbrough, Marton.

P. alni Linn. Common on alder, Lonsdale, Great Ayton, Eston; is green in summer but red and black in the autumn brood.

P. försteri Flor. With *P. alni* but much rarer—exactly the opposite to what holds in North Durham. In Mid-Durham the two are equally abundant. Both feed on alder, causing the unsightly cottony secretion which is such a nuisance when one is beating that tree; occasionally both favour birch.

P. buxi Linn. Common on box in July; in millions on the boxes in Middlesbrough Park.

P. spartii Guér. Sparingly on broom in Lonsdale.

Arytaena genistae Lat. Plentiful on broom in Lonsdale.

Trioza urticae Linn. Abundant on all low plants in September and October, but beaten quite freely from elm, blackthorn, etc.

T. albiventris Först. Sparingly in October and November from sallow and silver fir. Nunthorpe'

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Mr. R. Standen has been elected President of the Conchological Society Great Britain.

Mr. E. Heron-Allen has kindly sent us a copy of the late Prof. E. A. Minchin's address to the Zoological Section of the British Association.

We have received the *Annual Reports of the Huddersfield Naturalists, and Photographic Society for* 1914-15 (8 pages, 8vo), which includes notes on the year's work by H. C. Ellis, C. Mosley, J. H. Carter, E. Fisher and T. W. Woodhead.

The Proceedings of the Geologists' Association, volume XXVI., part 4, contains the presidential address of Mr. G. W. Young, F.G.S., entitled: 'The Geological History of Flying Vertebrates.' It is an exceptionally interesting contribution, and, *inter alia,* refers to a specimen from Whitby.

In Vol. XVII., No. 81 of *The Mineralogical Magazine,* which was issued in September, we notice a paper on 'The Garnet and streaky rocks of the English Lake District' by Mr. J. F. N. Green. Mr. Green concludes that the garnets, pyrites, and streaky alteration have been formed by circulating solutions under high hydrostatic pressure, probably during the solfataric stage of the Borrowdale volcanic episode.

The *Chester Society of Natural Science, Literature and Art* has issued its *Forty-fourth Annual Report and Proceedings,* which contain an account of the society's work during the year, as well as particulars of the additions to the society's library and museum. There are also the usual lists of members, balance sheet, rules, etc. With the report has been issued, separately, a lecture on 'Poems by Charles Kingsley,' by the Rev. Alexander Nairne, D.D.

'Over the whole basin of the Atlantic there is spread an enormously thick covering of what seems to be mud, but is really a mixture of tiniest shells, either perfect or in pieces, that need the microscope to be seen. This is called Globigerina Ooze—just as if it were a girl.'—*Cumberland Evening Mail.* To this *Punch* adds: 'We ourselves should never think of giving a girl a name like that.' We quite agree with *Punch.* Besides ooze Globigerina?

NOTES ON SOME YORKSHIRE COLEOPTERA.

T. STAINFORTH, B.A., B.Sc.

Among the beetles I have taken in various parts of Yorkshire during recent years, are six species not included in the county list. The occurrence of some of these is of more than local interest. Five are from the East Riding and one from the North Riding, and two of them are estuarine forms.

Noterus sparsus Marsh. (*capricornis* Herbst., *clavicornis* de G. *teste* Bedel).—On August 28th I paid a visit to the slightly brackish ponds on Saltend Common, near the Humber foreshore just to the east of Hull. They proved fairly rich in aquatic life, the Water Spider, *Argyroneta aquatica*, and the water beetles, *Coelambus parallelogrammus*, *Agabus conspersus*, *Dytiscus punctulatus*, *D. marginalis*, *Philydrus maritimus*, and other insects occurring in more or less abundance. Among the smaller beetles collected were a number of species of *Noterus* which proved to be undoubtedly *N. sparsus* Marsh., the characters defined by Sharp,* viz., *prosterno medio carinato* in both sexes, and *antennis . . . . articulis* 5° *et* 6° *longitudine subaequalibus* in the male, being clearly discerned. Further visits to Saltend during September and October proved that the beetle was very common there.

Fowler† says he has 'never found it in Derbyshire or Lincolnshire and can find no record further north.' Since this was written it has been found in several localities in Lincolnshire.‡ The Hull district, however, is the northernmost recorded station of the species in Great Britain. Strictly speaking, this is perhaps hardly a new record for the Hull area, as the species was included in a list of beetles of the Hull district in 1907,§ but without precise locality, and was possibly overlooked by the compilers of the Yorkshire list in the Victoria County History, or perhaps further confirmation of the record may have been considered desirable. As I have been unable to trace the specimen or specimens whereon this record was based, which, in the light of its re-discovery, was probably correct, it seems advisable to look upon the species as an addition to the Yorkshire fauna. I have re-examined the *Noterus* taken at Hornsea Mere and find that it is the remaining British species of the genus, viz., *N. clavicornis* de Geer (*crassicornis* Müll.).

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* Dr. D. Sharp 'On Dytiscidae,' Trans. Roy. Dub. Soc., Vol. II. (S. 2), p. 265.

† Coleoptera of the British Isles, I., 1887, p. 160.

‡ Linc. Nat. Union, Trans., 1908, p. 276.

§ 'Second List of Coleoptera occurring near Hull,' Trans. Hull Sci. and Field Naturalists' Club., Vol. I., part 4, p. 241.

It is somewhat unfortunate that doubt exists as to which of our species of *Noterus* de Geer gave the name of *clavicornis*. English authors have assumed it to be the *crassicornis* Müll., and *capricornis* Herbst.; while on the other hand continental authorities have followed Bedel as *testis* that it was the *sparsus* Marsh, *semipunctatus* F., and *crassicornis* Sturm. Here are fine ingredients for a nomenclature mix. In the list of British Coleoptera just compiled by Messrs. E. A. Newbery and W. E. Sharp the present continental nomenclature is adopted, and the two species of *Noterus* are given as *crassicornis* Müll., *clavicornis* de G., (*sparsus* Marsh).

This is doubtless quite correct and strictly in accordance with the laws of priority, but it means that we shall be puzzled to know which of our species is referred to by anyone recording *N. clavicornis* de Geer, without a synonym.

Helophorus mulsanti Rye.—In the same brackish pools at Saltend Common in which *N. sparsus* was found, *Helophorus mulsanti* Rye also occurs. I obtained my first specimens there in June, 1908, when it was fairly abundant, and I have since seen odd specimens on several occasions. Mr. E. Bilton and I obtained a few examples there on June 7th last. A critical description of the species is given in the October number of the *Entomologist's Monthly Magazine* (p. 274). Dr. W. Wallace of Grimsby has taken this beetle in brackish pools on the south Humber shore at New Holland, in Lincolnshire. It also occurs in the south, at Brighton, Deal, Sheppey, etc., and in the brackish water pools of the Nith at Dumfries. It will probably occur wherever suitable conditions prevail.

Bryaxis helferi Schmidt.—Mr. E. Bilton and I took several examples of this Pselaphid by searching at the roots of *Atriplex portulacoides* on the Humber shore between Welwick and Skeffling on July 25th. This is one of several salt marsh species whose northernmost limit in England appears to be the Humber estuary. Fowler says that it seems to be confined to the south-eastern and southern coasts, but since he wrote an example has been taken at East Halton Skitter in Lincolnshire.

Claviger testaceus Preyss (*foveolatus* Müll.), is perhaps the most important addition made to the Yorkshire beetle fauna during the past few years. I obtained two specimens from a nest of the yellow ant, *Donisthorpea flava*, at Robin Hood's Bay, in September, 1911. A more complete account of this insect and its distribution is included in a paper dealing generally with the guests of ants' nests, which appears in the preceding pages (385-397). The species will doubtless be found in other parts of Yorkshire.

Corylophus cassidioides Marsh.—This little Corylophid occurred among dead reeds at Hornsea Mere on May 30th. Only a few specimens were captured, together with a number of tiny

Trichopterygidae, though more were seen, and it would probably have proved common if specially searched for. The specimens were obtained by shaking the reed rubbish over sheets of paper. It has hitherto been recorded for the south and London district, the Fen district, Evesham and near Dublin.

Cartodere filum Aubé.—About a year ago a Hull chemist presented to the local museum a collection of preserved xerophilous plants from Australia. Recently, while examining these I captured about a score of tiny pale yellow beetles which proved to be *Cartodere filum* Aubé, a species easily distinguished from the other three British members of the genus by a distinct round impression on the anterior half of the thorax. It has occurred very rarely in Britain, and invariably in herbaria. In other countries it has sometimes been found in fungi. The only previous records for the British Isles are Burton-on-Trent, in herbarium ; on dried Aconite in the herbarium of the Royal Botanic Gardens, Edinburgh ; Gumley, Leicestershire, and in the Glasnevin Herbarium, Dublin. It is difficult to conceive how any beetle could pass through all its stages on such dry pabulum as that on which they were found in the Hull Museum. The Curator is now left to decide whether to kill the beetles and save the plants* or vice versa. All the four British species of *Cartodere* have now been recorded for Yorkshire.

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Animal Communities in Temperate America, as Illustrated in the Chicago Region : a Study in Animal Ecology. By **Dr. Victor E. Shelford,** University of Chicago Press, 362 pages, 12s. net. Many friends of Dr. Shelford will welcome this substantial contribution to our knowledge of the lower forms of animal life in a very interesting district in Amercia. The volume appears as Bulletin No. 5 of the 'Geographic' Society of Chicago, and illustrates in a remarkable degree the great extent of the geographical field on the other side of the Atlantic. The author points out that courses in field zoology usually lack the convenient background of organization which one finds in the doctrine of evolution when presenting the animal series from a structural standpoint. The need of some such logical and philosophical background into something more unified than haphazard discussions of such animals as were encountered in chance localities, was keenly felt at the beginning of the author's experience as a teacher of field zoology. Evolutionary background was tried, but failed, and was rejected ; genetics and faunistics proved inadequate. Behaviour as presented and studied by zoologists was incomplete. Plant ecological methods were, when unadapted, applicable only in part, while much of physiology dealt with organs and internal processes. The organization here presented has, in the main, grown out of three lines of thought ; the physiology of organisms as opposed to the physiology of organs ; the phenomena of behaviour and physiology, much of the data of which can be related to natural environments ; and the organised comparable data of plant ecology. Of course the actual species being American makes the book not quite so valuable as it might otherwise be to English readers, but the methods adopted are certainly worthy of consideration.

* He will probably do both !—Ed.

FIELD NOTES.

BIRDS.

Hen Harrier and Stonechats at Hebden Bridge.—A Hen Harrier ♀, was shot on Langfield Moor, near Hebden Bridge, on October 11th. It is only at intervals of years that this species is seen in the district now. On the previous day, Matthew Barr, of Walsden, discovered two Stonechats on the heath slopes of Jumble Hole Clough, the first authentic record for Hebden Bridge since 1889, when a single bird occurred in the Spring.—WALTER GREAVES.

Black Game near Selby.—On October 26th, Mr. R. Biddick unwittingly brought down a female of this species, which is an unusual event for this district. A possible solution as to the occurrence of such a local bird here, may be accounted for by the fact that the late Lord Wenlock turned several down on Skipwith Common, and asked the local gunners to respect the fact, in order to give them a chance, but I believe nothing came of the venture, and I can trace no record of this bird being indigenous to the suitable localities in this neighbourhood in former days. One may take it as probable that this example is a straggler from the above quoted attempt to establish them at Skipwith.—J. F. MUSHAM.

Black Game in Wharfedale.—It is interesting to note that Black-Game have nested on one of the Wharfedale Moors this year. A party of Harrogate sportsmen when Grouse shooting shot several birds on October 22nd, with which they were not familiar. They turned out to be young of the Black Grouse.—R. FORTUNE.

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ARACHNIDA.

***Megabunus insignis* Meade, a Harvestman new to the East Riding.**—I have obtained this quaint Harvestman at Houghton Woods near Market Weighton. It does not appear to be by any means abundant in this locality, as repeated searches during the year have only resulted in the capture of three examples. The first was taken among dead bracken near a pine wood, on May 1st, and the remaining two under dead heather in a birch and oak plantation, on May 24th, The species was first found in Yorkshire, previous to 1855, by Dr. R. H. Meade, who, however, gives no definite locality, and it has since been recorded for the Huddersfield district and Middleton-in-Teesdale by Mr. W. Falconer, and for Malham and the Rawthey Valley by Mr. W. P. Winter. *Megabunus insignis* is distinguished from all other British Phalangids by its very large eye-eminence which is armed on each side by five long divergent spines, . With this species fifteen of the twenty-four species of British Harvestmen have now been recorded in the East Riding.—T. STAINFORTH, Hull.

FUNGI.

***Pistillaria furcata* Sm. in Yorkshire.**—Early in October Mr. W. Pearson found on Seamer Moor, specimens of an interesting fungus, *Pistillaria furcata* Sm., which is new to Yorkshire. The specimens are from $\frac{1}{4}$ to $1\frac{1}{4}$ inches in height. The 'clubs' vary very much in shape from cylindric-clavate to spathulate and even to broadly cuneate or deltoid. Sometimes they are very broad at the apex and up to about 12 mm. across there. Occasionally they are somewhat forked at the apex and remarkably compressed. In colour they are waxy-white or with a pale yellowish tinge. The spores are elliptic-oblong, continuous, smooth and coloured grey, and in size about 10-14 × 4-6 μ. The basidia are remarkably large and turgid. The specimens were growing among the stones of a cart-track on the moor.—T. B. Roe, Scarborough.

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We regret to note the death of George Thomas Egglestone, of Consett, at the age of 64. He was at one time President of the Consett Naturalists' Field Club.

It is pleasing to find that an anonymous benefactor has sent £1,368 to the Manchester University to pay off the debt on the new extension of the museum, recently made to contain the Egyptian antiquities and local minerals.

We regret to record the death of Sir Arthur William Rücker, the famous scientist. He was born in 1848, was the eldest son of Mr. D. H. Rücker, and after a distinguished career at Oxford, became Professor of Mathematics and Physics at York College in 1874. He was Professor of Physics, Royal College of Science, London, 1886-1901, and Principal of the University of London 1901-8. From 1891 to 1898 Sir Arthur was Treasurer of the British Association, and was President in 1902. Other offices included President of the Physical Society 1893-95, and Secretary of the Royal Society 1896-1901. Sir Arthur was a member of several Royal Commissions.

At a recent meeting of the Lancashire and Cheshire Entomological Society, Mr. F. N. Pierce exhibited *Peronea fissurana* and *Halonata littoralana* and two new species of Tortrices discovered by examination of the genitalia, and read descriptions of the species. Mr. A. W. Hughes showed a series of *Triphæna fimbria* from Delamere, one example being of the scarce mahogany-red form. Dr. A. Randell Jackson brought an exhibit of humble bees and their parasites captured in his garden at Chester, comprising some forty species. Mr. H. B. Prince's exhibit contained long series of many local insects, prominent among them being *Bombyx trifolii* from the Lancashire coast: *Lycæna corydon* and var. *semisyngrapha*: *Vanessa urticæ*, several specimens having the usual orange-red colour replaced by fuscous-ochreous: and *Carterocephalus palæmon*. Mr. W. Mansbridge shewed *Lycæna ægon*, a series from Witherslack, Westmorland, with var. *masseyi*, and a male in which the orange spots on the underside were dark fuscous-ochreous, while the hind-wings on the upper side were slaty-grey: from Simonswood several specimens of *Acronycta leporina* var. *melanocephala*: *Hyria muricata*, moss form, and *Ennychia octomaculata* from Witherslack: *Rhodaria sanguinalis* from Wallasey: *Peronea comparana*, *P. variegana* and *Depressaria assimilella* from Delamere Forest, the last named being new to the county list. Mr. W. G. Clutten sent a specimen of *Gelechia scalella* taken at Burnley: this insect is new to the county list and an extension of its distribution towards the north.

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Naturalist,

CLASSIFIED INDEX.

COMPILED BY W. E. L. WATTAM.

It is not an index in the strictest sense of that term, but it is a classified summary of the contents of the volume, arranged so as to be of assistance to active scientific investigators; the actual titles of papers not always being regarded so much as the essential nature of their contents.

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MISCELLANEA.

CORRIGENDA.

Page 237, line 4, *for* "tiliacea" *substitute* "scortea."

,, ,, ,, 55, *delete* "P. tiliacea, Ach."

,, 308, ,, 5 from bottom, *for* "President" *substitute* "President-elect."

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