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THE  
NATURALIST:

A  
MONTHLY JOURNAL OF

*Natural History for the North of England*

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.S.A.(Scot.), M.B.O.U.,  
CURATOR OF THE MUNICIPAL MUSEUMS, HULL;

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THE SELBY SCIENTIFIC SOCIETY; THE WORTHING ARCHÆOLOGICAL SOCIETY; THE  
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WITH THE ASSISTANCE AS REFERÉES IN SPECIAL DEPARTMENTS OF

GEORGE T. PORRITT, F.L.S., F.E.S.      JOHN W. TAYLOR, M.Sc.  
RILEY FORTUNE, F.Z.S.

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# THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL  
PRINCIPALLY 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.,  
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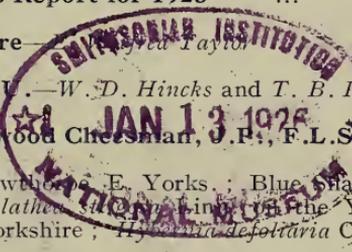
JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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# THE NATURALIST

FOR 1926.

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## NOTES AND COMMENTS.

EDWIN HAWKESWORTH.

Members of the Yorkshire Naturalists' Union, and particularly those who have enjoyed its membership for the last quarter of a century or so, will be gratified that Mr. Edwin Hawkesworth has accepted the office of President for 1926. For as many years as the present writer can remember Mr. Hawkesworth has always been a staunch supporter of the Union, and probably with more regularity than most, has attended its Council Meetings and Field Excursions. He has essentially the amateur spirit, and is particularly interested in the Geology of the country, frequently having led the Geological Section in its field rambles, and occasionally having described the Geological features of the districts visited. On its various Geological Committees, Mr. Hawkesworth has served for many years, but the Union is principally indebted to him for his onerous duties as Honorary Treasurer for many years, naturalists not always being the very best of business men from the point of view of the Honorary Treasurer! We should like to add our congratulations to the many which must have been tendered to Mr. Hawkesworth on his recent honour.

### THE LANCASHIRE AND CHESHIRE NATURALIST.

We regret to read the 'Preface' to the seventeenth volume of this well-known journal, issued recently:—'Owing to the lack of financial support, the publication of the *L. and C. N.* is suspended from the conclusion of the present volume. We have lost an extraordinary number of subscribers and contributors by death during the past twelve months, and this is the chief reason for our decision to suspend the journal.'

### LIVERPOOL GEOLOGISTS.

*The Proceedings of the Liverpool Geological Society* for the Sixty-sixth Session, edited by C. B. Travis, have been published (Vol. XIV., Pt. II., xvii., 99-195 pp.). The papers printed include 'Some of the Geological Problems of Prestatyn and Neighbourhood,' by E. Montag; 'Some Evidences of Early Man within and near to the Northern portion of the Vale of Clwyd'; 'Notes on the Petrology of Penmaenmawr Mountain,' by H. C. Sargent; 'Glacial Observations in the Wallasey District,' by G. Slater; 'Pollen Statistics from the Curragh and Ballaugh, Isle of Man,' by O. G. E. Erdtman; 'Progress of Investigation of the Mineralogical Composition of Sedimentary Rocks,' by P. G. H. Boswell; and 'Some

Geological Collections in the Liverpool Public Museum,' by Stella W. Harris. There are some illustrations of the Pollen grains from the Peat, some of the more important fossils in the Liverpool Museum, rock sections, etc.

A NEW KNIGHT VOLUME.\*

By the aid of his public lectures in various parts of the country, and by broadcasting, probably Captain Knight's descriptions of the nesting habits of the rarer birds, and par-



**Modern Falconer and Cadge Boy.**

ticularly those occupying difficult positions from the point of view of photography, etc., will have a ready sale. His chapters deal with Rarer Birds of Prey; Golden Eagle; Harrier; British Owls; The Heronry; Falconry; Modern Bird Sanctuary, etc. The photographs are admirable.

MUSEUM CHRISTMAS CARDS.

The British Museum (Natural History) recently startled us by issuing an annual Almanac. It has now made a further bid for popularity by issuing Christmas cards at sixpence

\* 'Aristocrats of the Air,' by C. W. R. Knight. London: Williams & Norgate, Ltd. xii. +166 pp., 21/-.

each. These are in folded covers with the words Fox, Rabbit, Robin, Stoat or Ermine respectively, neatly printed on the outside ; and inside, stitched with a white cord, is a four-page leaflet with a coloured illustration of the animal referred to, and two pages of descriptive matter, written in an interesting manner.

THE SECRETS OF THE EAGLE.\*

Although this book is largely devoted to the Golden Eagle and its ways, there are also chapters on various other species of rare birds including: Golden-Crested Wren, Dartford Warbler, Divers, Gulls, Arctic Skua, Woodlark, Crossbill,



Young Bitterns—'Little Gollywogs.'

Swift, Jay, Owls and Sandwich Tern. There is also an interesting chapter on 'The Sport of Bird Photography.' The whole volume is a record of photographic work among wild life, and is the more useful on account of the number of fine illustrations appearing therein.

' SOME ' PEAT.

We gather the following from a contemporary :—' A Peat fire is a familiar sight in many Scottish and Irish households, and has been so from time immemorial. Although suitable as a domestic fuel there are several drawbacks that make it

---

\* And other Rare Birds,' by H. A. Gilbert and Arthur Brook. London : J. W. Arrowsmith, Ltd., 196 pp., 10/- net.

impossible to use it for industrial uses, such as heating boilers or furnaces. The greatest of these is the large amount of moisture that is absorbed in it so thoroughly that pressing will not drive it out. A Canadian firm announces that it has now devised a practical method for eliminating this water, and it is now commencing to develop the enormous peat bog at Alfred, Ontario. It is estimated that there are *between two and three tons of peat in the bog*, and that this will now be available to manufacturers in the area between Montreal and Winnipeg, an area that is devoid of coal. It will thus take the place of fuel that to-day has to be transported many hundreds of miles. The development should therefore be truly economic.' Personally we always thought things on the other side of the Herring Pond were on a large scale, but this enormous peat bog containing between two and three tons of peat is *some* 'Discovery.'

#### INDEX ANIMALIUM.

We are delighted to find that before the year 1925 came to a close, Part VIII. of C. Davies Sherborn's *Index Animalium* for the period 1801-1850, containing pages 1773-2008—Daakar-Dorsalis—was published. This means that already over 2000 pages of this invaluable work are in the hands of scientific men. Quite apart from the question of the compilation of the references to the numerous species in this publication, the proof-reading alone is an undertaking which very few people in this country could tackle, and it is certainly a matter for congratulation that the author is able to see the work through the press.

#### SEEDLING STRUCTURE OF THE LIME.

At a recent meeting of the Linnean Society, Dr. H. S. Holden and Mr. S. H. Clarke read a paper 'On the Seedling Structure of *Tilia europæa* L.' Although the Lime flowers freely in England, it rarely perfects seed, but 1923 seems to have been specially favourable, as in the spring of 1924 more than seventy seedlings were noted at Nottingham, upon which the present observations are based. The seedling of *Tilia europæa* possesses two typically five-lobed epigeal cotyledons. These lobes vary in size, and may also develop accessory lobes. The aerial parts are thinly pubescent, the hairs being of two types:—(a) unicellular hairs confined to the epidermal ridges above and below the veins of the cotyledon laminae, but generally distributed over the hypocotyl; (b) club-shaped multicellular hairs confined to the upper surfaces of the cotyledons between the veins. The vascular system is tetrarch in plan, and typical root-structure is only attained some distance below the collet; seedlings showing triarchy or pentarchy also occur. Syncotylous seedlings, where the syncotyl

is unilateral and pronounced, show triarch symmetry. The polycotylous seedlings examined were pentarch, though the pentarchy was not homologous with that found in dicotyls.

#### AN IDEAL NEW MUSEUM.

We learn from notes in *The Belfast Telegraph* recently, by Mr. R. J. Welch that, judging from a photograph reproduced, 'the windows run right up to the ceiling—fireproof like all floors also—this obtaining not only high average lighting, so much wanting in almost all the great British museums, London included, but good reflection across the room to the wall cases from the light ceiling—a point of great importance in museum lighting, and very fully carried out in this building. The floor and ceiling—the floor of the Art Gallery above on top story—are reinforced concrete. All the steel beams are also encased in concrete, and there is no doubt that the Corporation of Belfast are to be congratulated on giving the citizens not only the most fireproof, but also undoubtedly the best lighted public museum in the British Isles, or even the Continent. Most other great national or municipal museums are merely "architects' museums," as they are called by curators; the Belfast Museum is one in which the requirements of an up-to-date Museum Committee and curator have been carried out. The square headed windows close to the ceiling of this building ensure the maximum of light obtainable . . . . the first of the exhibits to be housed in the new building may be seen the great war canoe of the Solomon Islanders, captured from a raiding party by Captain Casement, R.N., and brought home in one piece—not cut in two as usual for ease of carrying. It is the finest war canoe in Europe.' We take off our hat to Belfast.

#### THE PRIESTLEY CLUB.

The Priestley Club, Leeds, founded in 1875, has recently celebrated its jubilee by a dinner at the Leeds University. About a year after the Yorkshire College had been founded—in 1874—there arose the necessity for a club through membership of which those scientific men who had gathered in Leeds to form the nucleus of the College's teaching staff could keep in touch with one another and also with others who took a professional or amateur interest in scientific matters. The minutes of the preliminary meeting, which took place on Wednesday, June 30th, 1875, record that among those present were Mr. Richard Reynolds, who presided, Mr. Thomas Fairley, Prof. A. H. Green, Mr. Sydney Lupton, Prof. (afterwards Sir) Arthur Rücker, Prof. (afterwards Sir) T. E. Thorpe, and Mr. (afterwards Prof.) L. C. Miall, all well-known names in the city. It was natural that the name given to the club should be in memory of one of the most famous men in the

history of chemical science—Dr. Joseph Priestley, a former minister of Mill Hill Chapel, Leeds. At the end of its first year the club had a membership of 20, and the number has now increased to 150. Professor Smithells was President in 1891-2 and again in 1922-3; Professor (now Sir William) Bragg occupied the position from 1913 to 1915; and the present President is, appropriately enough, the past-President of the Yorkshire Naturalists' Union, Professor J. H. Priestley, Professor of Botany at the University.

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#### YORKSHIRE NATURALISTS AT HUDDERSFIELD.

THE Annual Meeting of the Yorkshire Naturalists' Union was held on December 5th in the Tolson Memorial Museum, which the Ravensknowle Committee of the Huddersfield Corporation had generously placed at the disposal of the Union. After the business meeting of the General Committee in the afternoon, the gathering assembled for the formal opening of the New Bird Room of the Museum, the ceremony being carried out by Professor W. Garstang, M.A., D.Sc., of Leeds, with Councillor J. H. Robson in the chair.

At the Annual Meeting in the evening, the Presidential Address was delivered by Professor J. H. Priestley, D.S.O., F.L.S., his subject being 'Light and Growth,' which he illustrated by lantern slides and diagrams. During the address the chair was taken by the Mayor of Huddersfield, Alderman Law Taylor. Hearty votes of thanks were accorded to the President for his services, and to the Mayor for his kindness in occupying the chair. The thanks of the Union were also expressed to the Huddersfield Naturalist, Photographic and Antiquarian Society, and to the Ravensknowle Committee of the Huddersfield Corporation, coupled with the names of Dr. T. W. Woodhead and Councillor J. H. Robson. Six new members were elected. Members and guests then proceeded to a *Conversazione* in the Museum, at which they were received by the Mayor and Mayoress of Huddersfield.

—: o :—

**Little Auk at Lowthorpe, E. Yorks.**—A Little Auk was shown to me last Monday (23rd November) which had been picked up dead in a field in this parish. It was very emaciated. The last specimen I handled had on its neck-feathers some lice, so I sent the bird to the late Charles Rothschild, who passed it on to a specialist in these parasites, a Presbyterian minister in the Shetlands. A report was duly received some weeks later, which I was allowed to see. But I gathered that there was nothing specially interesting about these particular insects, except, of course, the surprising fact that they were able to exist under the severe conditions inseparable from the life of their host.—W. H. ST. QUINTIN, Lowthorpe.

# THE YORKSHIRE NATURALISTS' UNION'S SIXTY-FOURTH ANNUAL REPORT FOR 1925.

(Presented at Huddersfield, 5th December, 1925.)

**The Sixty-Third Annual Meeting** was held at Sheffield on Saturday, December 6th, 1924, a report of which appeared in *The Naturalist* for January, 1925. The Presidential Address of Mr. Percy H. Grimshaw, F.R.S.E., entitled 'The Study of Diptera,' appeared in this and subsequent issues of the same journal.

**The Field Meetings** for the year have been six in number, viz. :—Egton Bridge (week-end), Middleton-in-Teesdale (Whit week-end), Coxley Valley, Flamborough, Malham (August Bank Holiday week-end), and Hackness (Mycological Meeting). In addition to these field meetings were arranged by the sections as follows :—Botanical Section at Ingleton and at Beckermonds; Entomological Section and Galls Committee at York; Geological Section at Clapham; Micro-biology Committee at Beckermonds. The attendance at these meetings has been very satisfactory and the usual descriptive programmes and reports have been issued; the latter appearing in *The Naturalist*.

**The Excursions for 1926** will be as follows :—

May 1st.—Yorks., N.E.—Askern.

May 22nd-24th (Whitsuntide).—Yorks., S. E.—Hornsea.

June 19th.—Yorks., S.W.—Castle Howard.

July 17th.—Yorks., Mid. W.—Otley.

July 31st-Aug. 2nd (Bank Holiday).—Leyburn.

**Membership.**—The efforts of the Executive towards increasing the membership have been satisfactory, but largely balanced by resignations and deaths. Members now number 405; the following have been elected during the year :—

Beaver, J. Foster, Sutton House, Bingley.

Beaver, Muriel Foster, Sutton House, Bingley.

Brooke, Norman, Maydale, Honley, Huddersfield.

Burnett, J., Kirkby Moorside, Yorks.,

Chilman, K. G., St. Peter's School, York.

Dyson, C. W., 19 Portland Street, Huddersfield.

Featherstone, C. R., M.A. Oxon., Clifton Rise, Yorks.

Fysher, T. D. Persy, Kingfisher Works, Sackville Street, Leeds.

Flintoff, T., Fieldhead, Cavendish Road, Kersal, Manchester.

Grainger, J., 'Devonshire Hall,' Headingley, Leeds.

MacMillan, W. E. F., 42 Onslow Square, London, S.W.7.

Mason, Rev. W. Wright, B.A., Salmonby Rectory, Horncastle.

Medlicott, Capt. W. J., Partridge Hill, Goathland.

Moulden, M., B.Sc., Allen Croft, Bingley.

Neare, Sheffield A., M.A., D.Sc., F.Z.S., F.E.S., 41 Queen's Gate, London, S.W.7.

Ping, Andrew Wentworth, M.A., F.R.M.S., St. Olive's, Clifton, York.

Russell, J. T., 52 7th Avenue, Blyth, Northumberland.

Smith, Miss H., 29 Colwyn View, Dewsbury Road, Leeds.

Throup, T., 2 Baptist Place, Bradford.

**The Affiliated Societies.**—The Austwick and District Field Club has been affiliated. The total numerical strength of the Union now stands at 3975.

**Obituary.**—The Executive regrets to have to record that the following death roll is heavier than for some years :—W. N. Cheesman, Alfred Clarke, P. W. Dawson, D. Fraser Douglas, E. J. F. Ingle, Canon H. Newton, Walter Roberts, J. T. Sewell, F. F. Walton.

**The Presidency** for 1926 has been offered to and accepted by Edwin Hawkesworth, Esq., Leeds. The Union wishes to record its indebtedness to its retiring President, Professor J. H. Priestley, D.S.O., F.L.S.

## VERTEBRATE ZOOLOGY SECTION.

**West Riding** (Mr. H. B. Booth) :—A Red-throated Diver was found in a garden at Carlton, near Skipton, late in February. It was later liberated in the River Aire at Skipton.

**Starlings.**—The very mild autumn and winter of 1924-5 caused a most unusual and extraordinary movement amongst the Starlings in the Bradford district. The autumn 'roosts,' chiefly composed of birds of the year, break up with the fall of the leaves, and most of the birds leave the neighbourhood. In 1924, at one of the 'roosts' that was being watched, the birds left after the night of October 25th, the weather being extremely mild at this time. A few days after very large flocks of Starlings were reported, and these formed an enormous 'roost' in a derelict nursery garden, at Bleak House, Cullingworth, where they remained all the winter. The residents in the neighbourhood described them as 'in millions,' or as darkening the sky like a big cloud, as the large flocks passed over. Mr. Rosse Butterfield, in what he considered to be a conservative estimate, put them down as at least as two to three hundred thousand birds. Fortunately the owner of the land did not object to the birds so long as they did not encroach too near his house. Early in February, in Mr. R. Butterfield's presence, three barrels of shot were fired into them to keep them from the house, and 66 birds were picked up as the result. Mr. Butterfield examined the crops of four of these birds. Three of them contained mixed vegetable and animal matter; all of them contained 'Leather-jackets,' the destructive larva of the Daddy Longlegs, and the fourth bird contained no fewer than 99 of these destructive grubs!! This shows what good a single bird is capable of doing. In 1925 I noted five nests of Starlings which appeared to be second broods. Four pairs were feeding young in the nests on July 4th, and another pair on July 5th. In two of the nests I had previously known young to have been reared. This is an unusual occurrence in this neighbourhood.

**Stonechats.**—Mr. M. Malone informs me that for two seasons a pair of Stonechats nested on Baildon Moor, and that this year there were two pairs. On June 27th, he saw young Stonechats out of the nest. Mr. A. Badland saw one of the same nests with eggs on June 13th. I was surprised to see a pair of Stonechats near the Hydro golf links at Ben Rhydding on April 26th. I rather fear that their nest was disturbed, or robbed, by some boys searching for lost golf balls in the gorse, as I was unable to find them again in the neighbourhood. As a nesting species the Stonechat has been an extremely rare bird in the West Riding.

**Black-headed Gulls.**—The Keasden gullery was visited, and a careful estimate made of about 450 pairs nesting on the two ponds. Mr. Bramley reports that they returned to Fairburn in the usual numbers; but only a few pairs remained to nest, owing to the altered condition of the water and islets.

**Hérons.**—Captain Preston tells me that the Eshton Herons still nest in Lords Wood, and the numbers are about the same, so far as he can tell.

**Wild Geese.**—'Gaggles' were noted on January 16th, and on January 24th, flying north-east at Saltaire (A. H. Lumby).

**Great Crested Grebes.**—Two pairs again nested on Malham Tarn. Mr. Bramley informs me that only three pairs again nested at Fairburn, rearing five young in all.

**Various.**—Mr. Geo. Priestman reports a late nest of the Bullfinch

in his grounds at Ilkley, the eggs hatching on September 1st. A Grasshopper Warbler commenced 'reeling' for hours on the evening of July 15th at Harrogate, and continued each evening for about a week (H. Mortimer and R. Fortune). Mr. Fortune writes me that a pair of Little Owls nested this year in Wharfedale, near Harewood. A Little Auk was captured alive by Mr. Eli Shackleton on Black Moor, near Bingley, about October 14th. It refused fish, but ate a small quantity of potted meat (E. P. Butterfield). A white House Sparrow was reported on the carriage drive at Saltaire on July 3rd. A correspondent (H. Shackleton) to *The Yorkshire Observer* of December 15th, 1924, reports a white Starling in a flock there. He had quite a close view of it, but only appeared to have seen it on one occasion.

**East Riding** (E. W. Wade) :—It might have been expected that an open winter and wet spring would have favoured early breeding by our resident and partially migratory birds, but it was not so. Perhaps the previous chilly and wet season had left them with diminished vitality. Rooks were ten days later than the average, and many eggs frosted in late March. At the end of March the Long-eared Owl had only just commenced laying, and the Tawny Owl was equally late. The later breeding Corvidæ were later than the average, as were the smaller resident birds.

Snipe, owing to the wet spring, were nesting in swamped meadows.

The Peewit in the East Riding still continues to decrease, except in certain favoured spots.

With few exceptions migrants arrived at the average dates. Swallows and Martins appeared in about the same numbers as last year, but some young broods of Swallows were destroyed by the bitterly cold weather early in July. Swifts were slightly fewer in number than in 1924. The Blackcap Warbler, usually a scarce bird, was almost as numerous as the Garden Warbler, but breeding very late. The Goldfinch still holds its own, and the Whinchat lingers on in small numbers in localities where the grass cannot be cut.

The Cuckoo, always a variable bird with us, was scarce in parts of Holderness, but more abundant than usual in the county bordering the lower part of the Derwent. Corncrakes arrived late, but on the western edge of the Wolds hold their own. Three pairs bred at Scampston, but in Holderness perhaps three pairs might have been found.

Partridges in Holderness have had the best year on record, and the hot weather has been generally favourable to them and to the Pheasant.

A great change in the status of our cliff breeding birds has been taking place ever since the plumage bill gave protection to the Kittiwake. These birds have increased out of all bounds, and are pushing the Guillemots and Razorbills off the ledges where once they had sole possession. In addition to this the curse of floating oil seems specially fatal to the latter. Eggs may frequently be seen on the ledges covered with oil and hundreds of dead birds are counted yearly along the coast from Filey to Spurn. Many ledges once full of breeding birds are now deserted altogether. Guillemots used to breed north of Filey, but all are gone.

The latest intruder, the Fulmar, is ousting the Herring Gull from the ledges north of Filey, and these latter have increased enormously along the whole range of our cliffs. No more dangerous foe to the Guillemot and Razorbill could be introduced among the eggs or young, and the climbers find their egg harvest diminishing every year. The Puffin also is decreasing in numbers.

A pair of Gannets, which took possession of Black Shelf in 1924, built a nest this year, but no egg was seen. The Cormorant has again bred on Flamborough cliffs, and is increasing in the district.

On 6th December, 1924, Mr. C. F. Procter shot a Bean Goose at Stone Creek. The Grey Wagtail has bred on the Driffield Trout Stream,

where the birds have been seen in previous years, but not known to nest. The Grey Crow has been more numerous than for the last two years. The Shelduck is increasing its breeding area in the Humber. In Burton Constable Woods the Heron has nested for the first time on record. The Little Owl has bred near Cliffe this year and is still increasing in the East Riding.

On 30th May a pair of Garganey Teal was feeding about noon along the south side of Hornsea Mere in company with a pair of Common Teal. Presumably the duck had come off the nest to feed.

The Woodcock has bred at Houghton this year and bred at Warter for the first time last year. Evidently it is extending its breeding range.

Some of our oak woods have swarmed with the larvæ of *Tortrix viridens*, and Rook and Starling have been very busy eating the pest.

The hot, dry summer has caused great distress among Thrushes and Blackbirds, which have resorted to the Humber mudflats in the search for food.

On 6th June, an adult Whooper Swan appeared on the lake at Scampston.

**North Riding** (W. J. Clarke) :—Observations during the year reveal the usual fluctuations in the numbers of various species. The Common Bunting has almost disappeared in the Scarborough district. Here also Goldfinches have been less abundant than in recent years, but in the Whitby district they are reported as having never been so common. Greenfinches have not been so abundant, and fewer Common Sandpipers have been seen on the streams about Scarborough. On the other hand, in this locality, Linnets, Lesser Redpoles and Whinchat have been more abundant. Curlews have been very common, but Golden Plovers less abundant on the moors. House Martins also have been more plentiful in the Whitby district, where many are now nesting in the sea cliffs. The Hawfinch nested at Egton Bridge and has been fairly numerous in the district. Stonechats are becoming more abundant. A pair nested at Scarborough in July, and around Whitby pairs are now generally distributed during the nesting season. An all white Fieldfare stayed about Hilla Green for some weeks in February. A White Wagtail was seen at Scarborough on March 26th. Pied Flycatchers have occurred at various places in the district. At Whitby a Black Redstart was seen in January. Kestrels (two pairs) and Tawny Owl have again nested within the Scarborough Borough boundaries. A pair of Short-eared Owls nested on Ugthorpe Moors (*The Naturalist*, August, 1925), and a Barn Owl was picked up dead near Scarborough in December. An adult Little Gull was observed to frequent Whitby Harbour from August 8th to the time of writing on October 14th. Many adult Lesser Black-backed Gulls have frequented the cliffs between Whitby and Robin Hood's Bay during the nesting season, but definite evidence of breeding has not been established. An immature Ivory Gull in first year's plumage frequented Whitby Harbour for six days in March. It was eventually captured alive, but soon died, and has been placed in the Whitby Museum. Fulmars nested at Redcliffe in some numbers, about twenty pairs being seen. Many were in the Whitby Cliffs, but were not seen to nest.

An immature Iceland Gull in second year's plumage inhabited Scarborough Harbour from November 14th, 1924, to March 25th, 1925.

**York District** (Sydney H. Smith) :—Our resident bird life maintains its usual number, except that there is a noticeable increase in rooks, Starlings and Sparrows, no doubt regretted on the part of the agriculturist. Swallows, House and Sand Martins have again been scarce, as have also Nightjars and Turtle Doves. An increase is noticed in Barn Owls, Tawny and Long-eared Owls, and just a few more Landrails have

been in evidence during the summer months. Carrion Crows, Jays and Magpies are very common in the woodland areas, but the Hooded Crow—once common as a winter visitor—has almost passed. I saw one near my house in York on March 1st, and Mr. Zimmermann reports one at Flaxton on February 8th, perhaps the same bird. Lapwings are fairly common in this locality as a resident species, and they would increase more rapidly were it not for the destruction of their eggs by farmers' rollers on the arable land they frequent. I saw the first eggs of the season offered for sale on March 25th. On June 21st a visit to the lake at Castle Howard disclosed plenty of wild ducks (Mallard) and a few pairs of Tufted Ducks, numerous Coots and Moorhens, and a pair of Great Crested Grebes proudly escorting three young ones. There were also a few pairs of Reed Warblers, all busy with nesting operations. On June 17th a nest of the Pied Flycatcher, containing five eggs, was found at Pocklington, and on July 8th another nest of the Pied Flycatcher was found near Welburn Hall with four well-grown young ones. The Stonechat is not a local breeding species, and I was pleased to find a pair of these handsome birds feeding young on June 25th on Strensall Common. The nest was first noticed by Dr. Gaynor, and the birds were afterwards observed by Mr. E. W. Taylor and myself. Mr. Zimmermann informs me that he watched a pair of Barn Owls raiding the young Rooks from nests in the rookery between Portland Street and Claremont Terrace, York, at 11-30 p.m. on May 21st. The old Rooks were making a great commotion, but this did not deter the Owls from their work. This occurred again on the 22nd, and on the 24th he distinctly saw both owls fly away with a fully fledged young Rook. Mr. Zimmermann also informs me that he examined the nest of a Hobby containing four young ones near Terrington on July 9th. In addition to the young there were the remains of many birds, and he counted fifteen Partridge wings, four Blackbird wings, six Thrush wings, two wings of Lapwing, the skin of a rabbit, besides a lot of small bird fragments unidentifiable.

On August 19th, seven immature Herring-gulls were shot at Huggate for the purpose of examining their crops. The result disclosed a half-pint of wheat (early sown winter wheat), which a large flock of these birds were busily digging up from the field that had just been drilled.

At Skipwith the Black-headed Gulls are very numerous, and a feature of the season has been their foraging over a wide area. The Rivers Ouse and Foss at York have attracted a quota of Black-headed Gulls all the summer, and their graceful flight and appearance is worth the toll they levy on small fish life.

Snipe and Redshanks bred freely in the Derwent Valley, and at least two pairs of Curlew successfully reared young on Strensall Common. Sparrow Hawks, Kestrels, Kingfishers, Dippers, Goldfinches and Hawfinches maintain their numbers, but Bullfinches appear to have decreased.

ARRIVAL OF SUMMER VISITING BIRDS.

- April 5—Chiffchaff, at Howsham.  
8—Willow Warbler, at Sutton-on-Forest.  
12—Sand Martin, at Howsham.  
13—Wheatear, at Huggate (several hundreds in Greenwich Dale).  
19—House Martin, at Castle Howard.  
Swallow, at Castle Howard.  
Tree Pipit, at Coneysthorpe.  
Whitethroat, at Coneysthorpe.  
Grey Wagtail, at Hovingham.  
Blackcap Warbler at Hovingham.  
21—Sandpiper, at Poppleton Bridge.  
Cuckoo, at Poppleton Bridge.  
22—Cuckoo, at Crayke.  
May 3—Landrail, at Bishop Wilton.  
Turtle Dove, at Bishop Wilton.

- May 6—Nightjar, at Barmby Moor.  
 „ 8—Swifts, at York.  
 „ 9—Sedge Warbler, at Pickering.  
 „ 10—Reed Warbler, at Castle Howard.

The general inference is that most migrant species were late in arriving in this district, and at first only in odd ones, and very small parties. The hedgerows only filled up with their noisy little feathered tenants when May was well advanced. The weather was, however, fairly suitable for successful nesting, and I believe this has been borne out in the ultimate result.

Mr. James Kendall (Selby) informs me that a pair of Great Crested Grebes attempted to nest on a pond adjoining the Selby and Drax Railway at Barlow, but was disturbed. On May 16th he saw three of these birds at the same place, and also found Kingfishers nesting. A little Owl was killed at Drax about May 12th, and a Bittern frequented the neighbourhood of Wressle during the winter of 1924-25.

I must express my indebtedness to Mr. V. G. F. Zimmermann for his valuable help in compiling these notes.

## MAMMALS, AMPHIBIANS, REPTILES AND FISHES COMMITTEE.

**Mammals** (Sydney H. Smith) :—Our common Yorkshire Mammals hold their own, and we find Foxes plentiful in the North and East Ridings, and average in the West Riding. Hares and Rabbits are, as usual, fairly abundant, except that in the East Riding a fungus-like disease has destroyed a large number of Hares. Some years ago I found Rabbits on the Wolds at Huggate suffering from a similar complaint, and some of the victims, whose heads were grey-cruled masses of dry 'fungus,' presented a most loathsome spectacle. Badgers and Otters are reported from several old haunts, and species such as Stoats, Weasels and Hedgehogs are ubiquitous. The latter are increasing in numbers in Wharfedale, on the authority of Mr. H. B. Booth, and Otters, to the number of four, are reported by Mr. E. W. Wade as frequenting the reservoir and outfall stream to the Humber near Brough during August. As this is a district where Otters are seldom seen, both Mr. Wade and Mr. C. F. Procter were greatly interested.

Our English Red Squirrel is becoming rare in Yorkshire, and I seldom see one in many haunts where once they were very common. It is difficult to account for this fact, as very few Red Squirrels are shot in the districts observed.

Mr. C. F. Procter relates that during April he saw a Weasel carrying a mouse across a road and shot at it. The Weasel dropped the mouse, and disappeared into the grass verge, but as he got up to the spot it dashed out again for the mouse, but got kicked a distance of several feet by Mr. Procter, who then walked away backwards. The Weasel, undismayed, again went for its quarry, and was allowed to take the mouse away.

Further notes record an Albino Rat (with pink eyes) as being caught at Mr. W. Brayshaw's, Burton House, Bransdby, on February 17th.

An unusual number of Porpoises was seen in the Humber during the late summer, and a Common Seal was observed on the sea-side of Spurn in July.

**Reptilia and Amphibia** (Sidney H. Smith) :—Mr. C. F. Procter informs me that he has seen a number of grass snakes in Holderness, and from reports given to him he is confident that this Reptile is increasing in that district.

The Palmated Newt has disappeared from its usual habitat, and the reason for their scarcity cannot be ascribed, as five or six years ago they

were most common. The Great Crested Newt, and the Smooth Newt are still in evidence, and do not appear to be affected either by increase or decrease.

**Pisces** (Sidney H. Smith) :—Owing to the low state of the rivers during the angling season of 1925 there is little to report.

A Barbel, 10 lbs. 15 ozs., was caught at Elvington in the River Derwent on August 30th, 1925, and Mr. H. B. Booth informs me of a 6½-lb. Trout that was caught in Malham Tarn during September, 1924, but not previously recorded. This fish has been preserved by Major Morrison.

The writer has had the opportunity of marking a quantity of Trout and coarse fish for the York Anglers' Amalgamation. Yearling Trout of 3 ins. to 4 ins. in length marked during February, and turned into Barton Hill Beck, grew on an average one inch by the end of April, but had not moved more than half a mile either up or down the beck. Coarse fish, like Roach and Perch, afforded details contrary to expectations. Perch marked February 7th were caught on the 28th after moving a quarter of a mile. Roach caught on February 28th had done the same, and another marked on the 7th of February had travelled two miles by June. All these fish had been placed in the River Ouse at Fulford, and their movement was upstream. The two most interesting records concern two Roach, both marked on February 7th and turned into the River Ouse at Fulford. One was caught on August 21st at Newton Beck end, about thirteen miles upstream, and another was caught in the River Nidd at Skip Bridge after a seventeen mile swim upstream. These fish have been returned to the water and may yet provide further details. It is proposed to mark a lot more fish in the near future. This marking has been done by means of a small numbered silver tablet affixed to the dorsal fin by means of a ring clip.

The Smelt, once a common visitor to the Humber, has disappeared, and rarely indeed is one caught now.

**Mammals** (W. J. Clarke) :—A Common Seal frequented the Harbour at Scarborough on March 21st and 23rd, 1925, and a young one was captured alive on August 12th, released, and probably the same individual was again captured in the North Bay on August 13th.

**Reptiles** (W. J. Clarke) :—An Ocellated Skink (*Chalcides ocellatus*), a common North African species, was found alive in a box of Jaffa Oranges at Scarborough on December 22nd, 1924.

**Fishes** (W. J. Clarke) :—Long-spined Sea Bullhead (*Cottus scorpius*) of unusual size, weighing 1½ lbs., was caught from the pier at Scarborough on January 21st, 1925.

A small Sting Ray, 14 inches long, was captured in the South Bay, Scarborough, on September 18th, 1925, and an example of the Starry Ray was found on the fish market at Scarborough, having been brought in by a local trawler on August 31st.

The Scarborough Mere was stocked in March with 150 Carp, 200 Roach, and 200 Tench.

## WILD BIRDS AND EGGS PROTECTION COMMITTEE.

**Birds and Eggs Protection Committee** (Mr. F. H. Edmondson) :—The Breeding Season for 1925, although not opening out too well, has proved quite a good one.

**PEREGRINE FALCON IN NORTH WEST YORKSHIRE.**—The nest of one pair was robbed by school boys, but after threatening to report them to their Head Master to get the District placed out of bounds, they promised to protect the eggs, one pair successfully reared their young, which later on flew safely away.

STONE CURLEW IN THE NORTH RIDING.—Six pairs reported at their haunt, four nests were found, and two lots of young were seen later, the other nests were not again visited.

STONE CURLEW IN THE EAST RIDING.—Extinct.

HORNSEA MERE.—We had some difficulty in finding a watcher, at last we secured our old watcher for part time, principally during the evenings and also Saturdays and Sundays. When we visited the Mere all was quiet and there were no signs of disturbance. The usual birds were seen, Great Crested Grebe, Little Grebe, Tufted Duck, Mallard and Pochard.

CASTLE HOWARD.—This is not an area protected by our watchers' but we are pleased to report the successful breeding of the Great Crested Grebe, three young ones being seen with their parents disporting themselves in the Lake. Tufted Ducks and Mallard have also bred successfully.

FULMAR PETREL.—The Fulmar has again bred at Speeton, and sparingly all along the Cliffs, good numbers of birds visited these Cliffs early in the season, but they gradually dwindled away as time advanced. On August 2nd, 1925, we visited Bempton and only saw about five pairs of birds along the Cliffs, and one well grown young bird in down. On August 9th, 1925, Sunday, we did not see one adult bird although the young one was still there.

SPURN.—We visited Spurn on Sunday, June 7th, 1925, and found everything in excellent order, Ringed Plovers and Lesser Terns were laying in good numbers both at the Beacon and Spurn Point. On June 17th, 1925, rough weather destroyed many nests, but the birds laid again, and all hatched off by July 21st, 1925. Shelduck are also increasing slowly, Redshank were quite numerous. On the whole the season at Spurn has been very good.

GREEN PLOVER IN THE NORTH WEST RIDING.—A fair number of birds arrived during the spring and these have bred fairly successfully. In the West Riding earlier in the season Crows and Rooks took a number of eggs, and in other Ridings the Jackdaw also levied toll on the Lapwings' eggs. From all over the County we have reports of Green Plovers breeding where this species has not been seen for several years.

THE MERLIN IN THE WEST RIDING.—Merlins in the West Riding have only reared a few young, several nests were destroyed by gamekeepers. On Friday, August 7th, 1925, on the moors behind Whitby we put up three young Merlins which could just nicely fly, probably a second laying, and were also greatly interested in watching two Short Eared Owls at 5-30 p.m. flying over the moors in bright sunshine, a report in *The Naturalist* affirms they have bred on these moors.

Our Balance Sheet is getting a little better, but there is still room for improvement. More subscribers are needed to enable the Committee to carry on this valuable work, and we take this opportunity to bring before the members and friends of the Yorkshire Naturalists' Union, who are interested in the preservation of bird life, our urgent necessity, and request that they send either large or small amounts before the spring of 1926; by so doing the Committee will be able to get to work in good time.

We should also like to point out to the Entomologists and Botanists, that while we are protecting our birds, in many instances we are also protecting both flowers and insects in the localities where our watchers are stationed.

**BALANCE SHEET.**

RECEIPTS.		£	s.	d.			£	s.	d.
Mr. Albert Hirst	...	5	0	0	Mrs. Dibbs	...	0	10	6
Mr. W. H. St. Quintin	...	5	0	0	Mr. C. H. Procter	...	0	10	0
Major Dent	...	2	2	0	Mrs. E. Horton	...	0	10	0
Mr. L. Gaunt	...	2	2	0	Mr. E. Cockshaw	...	0	10	0
Mrs. Bishop	...	1	1	0	Mr. H. J. Behrens	...	0	10	0
Miss Waterhouse	...	1	1	0	Mrs. J. S. Binns	...	0	10	0
Mr. S. H. Smith	...	1	1	0	Mr. G. T. Porritt	...	0	10	0
Mrs. Bishop	...	1	1	0	Mr. J. Y. Granger	...	0	10	0
Mr. Chas. O. F. Saner	...	1	1	0	Mr. R. Chislett	...	0	10	0
Mr. H. B. Booth	...	1	1	0	Miss Edmondson (1924)	...	0	10	0
Mr. Johnson Wilkinson	...	1	1	0	Miss Edmondson (1925)	...	0	10	0
Mr. J. Atkinson	...	1	1	0	Mr. Greevz Fysher	...	0	5	0
Mr. B. Lipscomb	...	1	1	0	Mrs. J. Wood	...	0	2	6
Mrs. C. Scott Hopkins	...	1	0	0	Mr. W. Waterhouse	...	0	2	6
Mr. F. H. Edmondson	...	1	0	0	DONATIONS.				
Mr. and Mrs. R. H. Edmondson	...	1	0	0	Collected by Mr. F. H. Edmondson	...	3	1	0
Mrs. C. Scott Hopkins	...	1	0	0	Mr. S. H. Smith, per Mr. Edmondson (Proceeds of Lecture)	...	0	10	0
Mr. W. G. Bramley	...	0	15	0	Mr. J. M. Mathers	...	1	7	0
Mr. E. W. Wade (1924)	...	0	10	6	Mr. C. Cooper	...	1	1	6
Mr. E. B. Gibson	...	0	10	6	Bank Interest to June 30th, 1925	...	0	5	0
Mr. W. H. Parkin	...	0	10	6					
Mr. W. H. Cheesman	...	0	10	6					
Mr. A. H. Lumby	...	0	10	6					
Mr. J. F. Musham	...	0	10	6					
Mr. E. W. Taylor	...	0	10	6					
							£44	6	6
PAYMENTS.		£	s.	d.			£	s.	d.
Balance brought forward	...	0	3	1	Mrs. Capstick	...	3	0	0
Mr. J. W. Medcalf	...	7	0	0	Mr. M. Hodgson	...	5	0	0
Mr. E. Norwood	...	3	15	0	Balance in hand	...	13	3	5
Mr. J. W. Medcalf	...	8	15	0					
Mr. J. Green	...	3	0	0					
Mr. Ned Pateman	...	0	10	0			£44	6	6

Audited by W. E. L. WATTAM.

J. WILKINSON, *Hon. Treas.*

**BOTANICAL SECTION.**

**Botanical Section** (Mr. J. F. Robinson):—After another open winter (1924-25) the rather cold and wet early months of the year proved unfavourable for flowering generally, especially amongst montane plants. Frosts at night and thaw during the day, with rain instead of snow, left the plants brown and the flowering display late and poor. On Moughton Scar no flowers of *Saxifraga oppositifolia* were to be seen on March 15th, while at higher altitudes on Inglebro' plants seem to have suffered less than at the lower altitude on the above-mentioned Scar, there being a fair amount of bloom in the higher stations on 10th April.

So far as the Flowering Plants were concerned the weather, particularly during the three summer months, was on the whole excellent, alike for their growth, observation and study. The hot weather in the latter part of May and in June brought plants to an early bloom which, however, was perhaps not quite of the normal duration; a certain amount of second flowering is very noticeable at the present time (September 29th), although the weather has not been quite so evenly fine as one used to expect from the harvest month. Hawthorn blossom was early and good, if somewhat uneven in quantity on individual trees and shrubs, in all localities. This season it was certainly a May flower, being noticed

at Ilkley as early as the 17th of the month, and about the same time in the East Riding, while in the North Riding it just managed to save its name in the latter days of the month. One correspondent writes that the common primrose was in bloom from December, 1924, to June, 1925, at an elevation of 900 feet near Keighley.

As usual the reports from botanists in all the Vice-counties embraced by Yorkshire show quite a number of interesting observations bearing upon the existence and flowering of less known plants. For example, *Andromeda polifolia*, in its West Riding stations flowered well this season, and still, so late as the writing of this report, odd flowers thereof are by no means rare. The dwarf Cornel (*Cornus suecica* L.) in its almost unique Yorkshire station among the north-eastern moors was very fine in early June, while in the last weeks of September, Elecampane (*Inula Helenium* L.) was still in flower after an apparently very vigorous vegetative growth, in its 50 years old station near Goathland.

The reports of the excursions and field meetings of the Union for the past season indicate that interesting records of new stations have been made for many species. Apart, however, from the excursion programmes, and in the intervals between meetings, some very notable work has been done by individual botanists, of whom the number is pleasingly increasing. This has resulted in several entirely new plant-records being made in three of our vice-counties. In June last the northern part of V.C. 61 (E. R. Yks.) yielded *Hippocrepis comosa* L. to a keen lady botanist; while in different parts of V.C. 62 (N. R. Yks.) the three following have been discovered, viz., *Ulex minor* Roth. and *Lactuca alpina* Benth., both in the Pickering district, where the latter—an introduction—has been known wild for the past 15 years; and, quite recently, by the seaside, *Centaureum capitatum* R. and B.

It might be well to mention here that two plants have in recent years been introduced on Austwick Moss, V.C. 64, viz., *Typha angustifolia* and *Hottonia palustris*; the latter has spread quickly and had a fine show of flowers during the late summer. Perhaps the most notable new locality record, however, for this V.C. is that of *Carex filiformis* L.

**Fruiting in 1925.**—From excellent notes sent in by widely-separated observers, combined with those made by the secretaries, who have had special facilities for witnessing the conditions in all parts of Yorkshire, as well as in others of the six northern counties, it is found that the fruiting of most shrubs and trees, is, with few exceptions, below the average. In this connection, those species which flowered earliest have the poorest crops of fruit; but in several cases, e.g. Brambles and Roses, which naturally blossom in summer rather than spring, have everywhere an excellent show of fruit. The blossoming of Pear and Apple—'Crab' as well as cultivated—was good, but the fruiting bears no sort of correspondence to this, for there is scarcely a Pear to be seen in any orchard, and the Apple crop is only a low average one. 'Roses and Brambles flowered well in June during the period of warmth and drought and have now abundant fruit of excellent quality. Raspberries, especially the uncultivated, which flower much earlier than either of those last named, were only a fairly large crop this season, and the individual fruits frequently very poor, for which again the drought might be responsible. The Cloudberry of the high Pennine moorlands is reported to have been a complete failure; but of other moorland fruits, e.g. Bilberry (Whortle- or Blae-berry—*Vaccinium myrtillus*) was on the whole a good average crop, especially in places among the north Yorkshire moors. The black Crowberry (*Empetrum*), most insipid of succulent fruits, have been very scarce everywhere in the northern counties.

Of the Pruni—Sloes, Plums, etc.—again chiefly early flowering species, the crop is strikingly poor on both wild and cultivated trees; but where *Prunus Padus* L. (Bird cherry) has not been defoliated by the ravages of the caterpillars of *Yponomeuta padi* in the N.E. Yorkshire

gills and dales, the blossom and sequent fruits were normal in quantity.

Of higher shrubs and trees—mostly very early flowering—the quantity of fruit is very small generally, a most pronounced lack in this respect being noticeable in Sycamore, Broad-leaved Elm, Ash (*Fraxinus*), Alder, Hazel, Birch, Oak, Beech and Hornbeam. Indeed Acorns, \*Hazel Nuts and Beech-mast are most conspicuously absent this year. Not every Hawthorn bush or tree has fruit, but the general crop is from very fair to good. Wild Service and Mountain Ash in many places among the Pennine and north-eastern hills and dales have scarcely any fruit at all.

Horse Chestnut and the Spanish Chestnut flowered well, especially the latter, but on the former the number of fruits is small, and on the latter, the fruit, though plentiful, is rarely fertile or well filled in our Yorkshire clime. The Guelder-rose (*Viburnum opulus*) and Honeysuckle flowered well, and in cases are very well fruited; and at the present time (29th September, 1925) a good gathering can be obtained anywhere, of well-ripened Elderberries.

Of other than the Flowering Plants Section it may be said that the Bryological has had a busy year with a still heavier time promised next year, when the British Bryological Society will visit Ingleton at Whitsuntide. The Mycological section keeps up its activities, in spite of heavy losses in its personnel. The Plant Galls Committee, which also comes under Section E on our syllabus, has lost a valuable member, which, however, is Lancashire's gain—and so the work still goes on.

**Botanical Survey Committee** (Mr. W. H. Burrell).—The activities of this committee have been well maintained as indicated by the reports of the Union's meetings, and notably by that of the Middleton meeting in which attention was drawn to the biotic and other factors influencing the distribution of Juniper. The cotton grass is being studied independently from two different aspects, and it is hoped that the results of these investigations will shortly approach the stage of publication. The question of pollen distribution in the peat is now receiving some attention in connection with peat investigations, and there are also a number of smaller problems under consideration.

**Committee of Suggestions** (Mr. C. A. Cheetham).—The two investigations which this committee has in hand, viz.—The Pennine Peat and the fauna and flora of the rivers Aire and Wharfe—are still being steadily worked at. Although we have not heard of anything being started by the British Association Committee which was to investigate the Quaternary Peats of the British Isles, there is evidence of interest in the subject in the pages of *Nature* and the *Journal of Botany*, where some of our members discussed the age of the Pennine Peat, and a recent visit from one of the Scandinavian experts to the Huddersfield area may help the steady work of our members.

Thanks to the co-operation of the Leeds Philosophical Society and a grant from the Royal Society, the rivers investigation has been put on a good footing, and the recent meeting of those interested at Buckden provided opportunity to discuss the problems which are continually cropping up; the field is very wide, and there is room for many helpers from all sections of the Union.

## GEOLOGICAL SECTION.

(W. S. Bisat and J. Holmes) :—During the current year two principal lines of research have been followed in the investigation of the Goniatite zones in the Carboniferous Rocks.

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\* The past fortnight, 14th to 28th September, I have searched hundreds of bushes and even big trees of *Corylus avellana* (Hazel), and during my search have found only six nuts (and only one pair amongst the six—none of the threesomes, foursomes, etc., of former days.—J.F.R.

In the neighbourhood of Clapham the almost virgin area of the Grit Series, as seen in Keasden Beck and neighbouring streams, has been seriously worked for the first time, and proved to contain a large number of goniatite zones corresponding with those of the Sabden Shales.

A paper describing the results attained was published in *The Naturalist* for October.

A commencement has been made with the study of the goniatite zones of the knoll limestones. The Viséan knolls are divided in the north of England into two areas of exposure, the more northern one extending from Settle through Malham to Cracoe (lying along the line of the Craven Fault), the southern area of exposure being in Derbyshire.

In the northern area we have had the advantage of the pioneer work of Prof. Garwood and Miss Goodyear, and the August excursion was almost wholly devoted to the attempt to obtain goniatites from the knolls in the neighbourhood of Malham. The fortunate re-discovery by Mr. Hudson of the exact spot on Wedber Brow which yielded *Goniatites crenistria* to Prof. Garwood enabled a practically complete suite of specimens of all sizes of the Wedber form to be collected. They seem to be identical in detail with the form referred to by Girty in 1909 (Oklahoma paper) as *G. choctawensis*, but their stratigraphical relationship to more normal *crenistria* is still doubtful. The first steps towards a stratigraphical division of these knoll limestones were made, however, when members of the Geological Section succeeded in finding three goniatite zones in stratigraphical succession at Black Hole, half a mile south of Malham. So far as we are aware this is the first time that any direct observations of a zonal succession in the Upper Viséan knolls have been made, and the results may have a far-reaching effect. It seems probable that the highest bed at Black Hole is identical in horizon with the lowest fossiliferous horizon (black shaly limestones with goniatites and *Posidonomya becheri*) seen in Eastby Beck near the mill. In the Derbyshire area Mr. Jackson has been collecting for many years, and he has kindly lent us the whole of his goniatites for examination. Mr. Jackson's results will probably be published this winter, and will throw much light on the stratigraphy of Derbyshire, especially at the junction of the Upper and Lower Carboniferous.

It is desirable that anyone finding knoll goniatites should record their precise position on the 6 in. Ordnance Map, and if a succession of only two goniatite forms can be established at any exposure it would be of great help for correlation purposes. Goniatite zones are in constant use as stratigraphical aids by the Lancashire and Yorkshire units of the Geological Survey, and they are also being adopted enthusiastically on the continent.

The Sorby Scientific Society is making a detailed investigation of the Lower Carboniferous Rocks in Middleton Dale, Derbyshire, and considerable progress has been made during the year.

The members of the Hull Geological Society have been continuing their investigation of the sub-Cretaceous clays on the Lincolnshire shore of the Humber at South Ferriby, and have succeeded in proving the Lower Kimmeridgian age of the clays below the Red Chalk near that village. This still leaves as a mystery the occurrence in past years of belemnites of Speeton type on the foreshore.

(*To be continued.*)

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'Dons and Mastodons. "Mammoth Remains at Oxford." *Head-line in morning paper.* We think he is wise. He won't feel out of date among the other antiquities.'—*Punch.* We think it's because at last he has found trousers that will fit him.

## VERTEBRATE ZOOLOGY IN YORKSHIRE.

E. WILFRED TAYLOR.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists' Union was held at Leeds on October 24th, Mr. F. H. Edmundson presiding. The sectional meeting was preceded by a meeting of the Yorkshire Wild Birds and Eggs Protection Acts Committee, and of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee.

The reports of these committees were approved, as were also the annual reports by the divisional officers of the North, East and West Ridings and the York District.

An address was given by Mr. F. H. Edmondson on 'Migration,' in which he dwelt upon the regularity shown in bird migrations, and mentioned that in some parts of Europe the arrival of the White Stork is hailed as a sign that winter is past, and as an excuse for a general holiday.

The factors governing migration are not easily discovered, but must be sufficient to explain, for instance, why the Swallow should leave a land of warmth and plenty to visit these often inhospitable shores. There seemed to be a natural law which impelled all creatures to visit the locality of their birth in order to reproduce their kind—perhaps, too, the young reared in the cooler parts of the earth were naturally more hardy, or that the longer northern day was an advantage in rearing the family.

It seemed probable that climatic changes had gradually modified the distribution of insect life, and that species of birds which once were resident in these islands had been compelled by shortage of food to move southwards in winter time, and that as soon as the conditions were once more favourable they returned. This instinct did not appear to have been modified as the distances between the summer and winter quarters increased.

The features governing the migration of fish were particularly complex, for while birds obeyed a general law, the inhabitants of the water behaved in a contradictory manner. Thus the Eels left our rivers to spawn in the Atlantic Ocean, while the Salmon left the sea in order to spawn in our rivers.

A discussion followed the paper, and all those present were not prepared to admit that a natural law impelled all creatures to return to the locality of their birth. Discussion also centred round the means by which birds find their way at migration times, and it was generally thought that both the sense of sight and a sense of direction were called into play.

A paper was given by Mr. R. Chislett entitled 'The Greenshank on Scottish Moors,' in which the lecturer described his experiences, and showed a fine series of photographs of this rare and interesting bird. A journey was first made into Sutherlandshire, where a local gamekeeper conducted him to a Greenshank's nest, which, however, only contained broken pieces of shell. The next ten days were spent searching miles of boggy difficult country; a few odd birds were seen in addition to the original pair, and it was eventually decided to search again in the vicinity of the first nest, where several 'scrapes' were found, and a new but empty nest close to a sunken wooden post. On a later occasion the lecturer, in company with Mr. Fowler, was again shown a Greenshank's nest by a gamekeeper, and was fortunate enough to find a second nest in a little patch of ground raised a foot or so above the level of a swamp, and, as usual, by the side of a stone. The surroundings were much more mountainous, and not nearly so swampy as had been the case in Sutherlandshire. The second Greenshank proved very suspicious, and

two and a half hours elapsed before she returned to the nest ; during the interval she frequently uttered a note sounding like ' clip, clip, clip.' A few days later the nest was again visited and both birds were in evidence, but it was not found possible to distinguish the sexes. The third day spent at the nest proved a complete blank, but photographs were obtained on June 2nd showing the bird on and around the nest, in the act of turning the eggs, and even asleep on the nest. The plumage rather suggested the Nightjar in its protective scheme when the bird was at rest, but the white upper tail coverts were conspicuous in flight. The eggs hatched on June 6th, and for the first time the bird used the ' clip, clip,' call at the nest. As each chick hatched the egg shells were removed by the bird, and on one occasion she was seen to drop them in a pool of water. On the following morning the young Greenshanks were down by a pool of water, more than a mile from the nest, and the parents were very noisy, which was not the case during incubation. Each pair of birds occupied a wide stretch of moor, and had its own feeding loch two or three miles away, and here the birds spent their time when not engaged in incubation.

Mr. T. W. Fowler then related his experiences at the other nest, which was near a swampy pool, and was unusual in having no post or stone in the vicinity. The early experiences at this nest led the lecturer to believe that a successful series of photographs could be obtained without difficulty, but for some unknown reason the bird quite unconcernedly left the nest, and two completely blank days followed.

Many photographs of this rare bird were shown on the screen by both lecturers, and much appreciated.

A paper was next given by Mr. T. W. Fowler entitled ' The Dotterel on the Grampians,' in which the lecturer related how he and two companions set off on foot with provisions for three days, and made a deer-stalker's hut, twelve miles distant, on the slopes of the Cairn Gorms, their first objective. From this shelter the three peaks of the range could be plainly seen, and many photographs were shown of the wild and hilly country traversed ; one view taken from the eyrie of a Golden Eagle being particularly wild and impressive. From the deer-stalker's shelter a stiff climb of five miles had to be undertaken before reaching the summit of Brairiach, where a distant and fleeting glimpse of a Dotterel was obtained. Subsequently a second bird was seen, and no chances were taken this time, for while two of the party watched it through glasses, the third followed it on foot, and was led to the nest which contained three eggs. Like most of its species, this bird was very tame, and when the tent had been erected, subjected it to a minute inspection more with an air of curiosity than apprehension. Eventually, as the bird was too interested to return to the nest, the lecturer left the tent and sat down about twenty yards away, when the Dotterel subjected him to the same careful scrutiny. Finally, the tent was removed as useless, and a string was attached to the shutter, but this in turn was disregarded in favour of the simple expedient of sitting down near the camera, when the Dotterel returned to the eggs and proved an easy subject, even allowing the lecturer to stroke his back while brooding. The sitting bird was very soberly coloured, and was no doubt the male, the usual relationship between sex and plumage being reversed with this species. The much more brilliantly plumaged female was seen in the distance on one occasion.

Photographs were also shown of several other species, including the Tree Sparrow, Pochard and Teal.

A discussion followed, and it was suggested that Greenshank might carry the newly hatched chicks to the feeding grounds as Woodcock were known to do.

In conclusion a hearty vote of thanks to the lecturers and the lanternist was proposed by the president, and carried unanimously.

## ENTOMOLOGICAL SECTION OF Y.N.U.

W. D. HINCKS AND T. B. KITCHEN.

THE Annual Meeting of this Section was held in the Leeds Museum on Saturday, October 17th. Mr. G. T. Porritt, the President, occupied the chair. There was a good attendance of members. The exhibits were as follows :—

COLEOPTERA.—Mr. Bayford :—*Dryophthorus corticalis*, a genus and species recently added to the British list by Mr. Donisthorpe.

Mr. J. M. Brown : *Sinodendron cylindricum*, *Hister 12-striatus* and *Orchestes foliorum*, from Middleton-in-Teesdale, *Platycis minuta*, *Lebia chlorocephala* from Sandens, and *Hedobia imperialis* from Askham.

Mr. J. R. Dibb :—*Bruchus* sp. ? *Pentharthrum huttoni* and *Monochamus sartor* from the Leeds district.

Mr. M. L. Thompson :—*Quedius fulvicornis*, *Tetropium gabrielli* var. *crawshayi*, *Anisosticta 19-punctata*, *Philonthus micans*, *Choleva longula*, and *Galerucella lineola*.

LEPIDOPTERA.—Mr. G. T. Porritt :—*Orygia antiqua* var. *confinis*, from the Royd Edge Moors, near Huddersfield ; *Lycæna icarus*, from Tyrone, nearly twice the size of English specimens, the females azure blue, the red spots very large and on the outer margin of both fore and hind wings. Melanic *Boarmia roboraria* (var. *meliana*), bred from the Epping Forest district.

Mr. B. Morley :—*Bombyx quercus* var. *callunæ*, long series of peculiar dark-grey females, the males also darker, bred from black larvæ, from Penistone Moors ; *Smerinthus tiliæ*, dark underwing varieties from Kent and Somersetshire, and a 'one spot' variety from Kent ; *Xanthia aurago*, *Hedya lariciana*, *Orthotænia antiquana*, and others from Skelmanthorpe.

Mr. T. A. Lofthouse :—Several species from the Middlesbrough district.

Mr. C. A. Cheetham :—*Zeuzera pyrina*, from Leeds.

ORTHOPTERA.—Mr. M. L. Thompson :—The large exotic cockroach *L. gigantea* imported into Middlesbrough.

TRICHOPTERA.—Mr. G. T. Porritt :—*Mystrophora intermedia*, discovered as new to Britain by Mr. K. J. Morton, at Coniston in April last.

HYMENOPTERA.—Mr. C. A. Cheetham :—*Ammophila sabulosa* L., a Sandswamp from Allerthorpe in August.

HEMIPTERA.—Mr. J. M. Brown : Species of *Calocoris*, including *striatus*, *ochromelas*, *infusus*, *alpestris*, *6-guttatus*, *Dichrooscytus rufipennis*, *Piezodorus lituratus*, *Zicrona coerulea*. Specimens of species new to Yorkshire : *Aphanus subapterus*, *Corixa carinata*, *Eupteryx germari*, *Trioxa galii*. Specimens and drawings of the Scale insects : *Orthezia cataphracta* and *Newsteadia flaccosa*.

COLLEMBOLA.—Mr. J. M. Brown :—Specimens and drawings of a recently described species, *Orchesella litoralis* Brown, taken at Runswick Bay.

DIPTERA.—Mr. C. A. Cheetham :—A box of the best 1925 captures containing the following species : *Chironomus tarsalis* Wlk., *Anopheles plumbeus* Steph., *Finlaya geniculata* Ol., *Idioptera fasciata* L., *Tipula fascipennis* Mg., *T. irrorata* Mcq., *Oxycera trilineata* F., *Beris morrisii* Dale., *Tabanus cordiger* W., *Lasiopogon cinctus* F., *Dioctria baumhaueri* Mg., *Atherix ibis* F., *Thereva annulata* F., *Acrocera globulus* Pz., *Empis vitripennis* Mg., *Euthyneura gyllenhali* Ztt., *Chelipoda melanocephala* F., *Sciodromia immaculata* Hal., *Platypeza consobrina* Ztt., *Psilopus contristans* W., *Dolichopus simplex* Mg., *Hypophyllus discipes* Ahr., *Eristalis sepulchralis* L., *Chrysotoxum cautum* Harr., *C. bincinctum* L., *Conops flavipes* L., *Sicus ferrugineus* L., *Zodion cinereum* F., *Loxocera sylvatica* Mg., and *Tephritis absinthii* F.

Mr. E. G. Bayford : *Psilosciara stokesi* Edw., reared from a rotten

willow log at Barnsley (*vide E.M.M.*, Oct., p. 288); *Sciara caudata* Wlk. = *longiventris* Ztt., and *Pezomyia vanderwulpi* De Meij., both new to the British list, bred from the same log (*vide ante*).

Mr. W. D. Hincks:—Some Yorkshire species of the genus *Chironomus*, including: *venustus* Staeg., *longistylus* Goet., *plumosus* L., *chloris* Mg., *nigrimanus* Staeg., *dorsalis* Mg., *tentans* Fab., *viridanus* Ruthe., *pedestris* Mg., and *pedellus* De Geer.

The evening meeting was devoted to the nomination of officers and to the reading of recorders' reports for the past year.

No changes were made in the list of officers, though several additions were made to the various committees.

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'Getting and Conversion of York Stone' is the title of an interesting article in *The Quarry* for November.

A record of the Grasshopper-Warbler nesting in North Lincolnshire, occurs in *British Birds* for November.

E. A. Butler reports 'An Invasion of *Halticus saltator* Geoffr. (Hemiptera), in *The Entomologist* for December.

H. Womersley describes 'Two New British Collembola' in *The Entomologist's Monthly Magazine* for November.

'*The Revue de Géologie et des sciences connexes*,' published at Liège, continues to appear, with its abstracts of papers on various aspects of geological science.

'Notes on Bulb Mites and Eelworms,' by A. S. Buckhurst, and on 'The Buzzard,' by F. H. Lancum, occur in *The Journal of the Ministry of Agriculture* for November.

*The Journal of Conchology* for October contains the second part of J. W. Jackson's Presidential Address on 'The Distribution of *Margaritana margaritifera* in the British Isles.

W. P. Pycraft writes 'On the Recognition of Several Species of Post-Mousterian Man: and the Need for Superseding the Frankfort Base-Line' in *Man* for November.

*The Selborne Magazine*, No. 353, February to December, 1925, has been received, and contains a note on 'Nature Study in Winter,' the Brent Valley Bird Sanctuary Balance Sheet, etc.

Mr. H. B. Booth records Meadow Pipits above the 4000 feet level on Brae Riach in *The Scottish Naturalist* for 'September-October.' This seems very high for the Meadow Pipit, as it does for Mr. Booth!

In *The New Phytologist* for October, R. E. Hunter and W. E. Mottram write on 'The Occurrence of the Preservation of Plant Tissues'; E. R. Saunders on 'Perigyny and Carpel Polymorphism in some Rosaceae,' and R. W. Phillips on 'The genera *Phyllophora*, *Gymnogongrus* and *Ahnfeldtia* and their Parasites.'

R. Elmhirst describes 'The Feeding Habits of the Sea-Anemone, *Actinoloba*'; the editor refers to 'Human Transport and Wild Life' (with a map showing 'Localities on coasts of Britain from which oiled birds have been recorded'), and J. H. Stenhouse records 'The Petchora Pipit at Fair Isle: an addition to the British Avifauna,' in *The Scottish Naturalist* for 'September-October.'

*British Birds* for December contains notes on the courtship of the Teal, further reports on the recovery of Marked Birds, and a note on the occurrence of twenty-seven Ravens at one spot in the Lake District, though one wonders whether the publication of this last information is quite wise. Apparently the Editor of *British Birds* was doubtful about Miss Frances Pitt's record of the White Wagtail which appeared in *The Naturalist* a little while ago, and communicated with her in reference thereto, the result of which, however, appears to be that the record has been accepted.

## In Memoriam.

WILLIAM NORWOOD CHEESMAN, J.P., F.L.S.

By the death of William Norwood Cheesman at Selby, on November the 7th, 1925, Yorkshire has lost a distinguished and gifted naturalist, one of that diminishing band of scientific amateurs who have done so much for the advancement of science in the county. Although a busy man in local affairs,



and the head of an important business firm, Mr. Cheesman found time to pursue his studies in Natural History, and especially Botany, which he had taken up as a young man, and in which his interest was maintained throughout life. Natural History was, I believe, his first love, but his mental activity was such, and his interests so wide, that, partly as a result of his close association with Selby Abbey, he also became attached to the study of archæology, and was for many years a prominent member of the Yorkshire Archæological Society. He had a great store of knowledge of the details of the structure and antiquarian lore of Selby Abbey, and it was a great pleasure to wander round the Abbey with him, and listen to his discourse on its many features of interest.

As a Freemason, Mr. Cheesman was also very much interested in the Masons' craft, and made contributions of great value on Masons' Marks, and on the Marks of Mediæval Craftsmen. He brought together a well arranged, and beautifully illustrated, series of observations by various authors on these Marks, incorporating many notes of his own. It is not so well known as it might be that Masons' Marks may be found in abundance on nearly every village Church, Abbey and Castle in our own country, and that they throw much light upon the progress and methods of building. Cheesman did much to promote work in this direction, and made the interesting suggestion that a thorough search be made in every old building by local workers, and that the marks thus collected might then be classified and arranged by a competent authority. 'The work is commended as being of particular interest and fascination, leading to a better appreciation of the glorious buildings which the mason craftsmen designed and constructed in bygone times, and which now, even in ruin and decay, fill us with admiration and reverence.'\*

Although retaining a great interest in general Botany, Mr. Cheesman devoted himself more and more during the later years of his life to the study of Mycology. He was a highly esteemed member of the Yorkshire Mycological Committee, and took a prominent share in its work. He was especially interested in the Mycetozoa, and had made himself well acquainted with the microscopic structure and life histories of a large number of typical forms, and was an ardent collector in the field. He had a wide knowledge of the distribution of the Mycetozoa in this country, and had made observations also on these forms in foreign countries, which he visited from time to time. His lectures on mycological topics to the members of the Mycological Committee were marked by clear exposition and precise statement, and were much appreciated by those privileged to listen to them. In 1916 his notable work in connection with Yorkshire Mycology led to his election as President of the Yorkshire Naturalists' Union, a position which he filled with dignity and success. In his Presidential Address to the Union he dealt with various aspects of the study of Mycology, of which he gave an able summary of the state of our knowledge at the time, and placed before his audience some striking figures illustrating the extreme importance of the study of the fungi from an economic point of view which he had strongly advocated at various times in his career.

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\* 'On Masons' Marks in particular, and Mediæval Craftsmens' Marks in general.' By W. Bro. W. N. Cheesman, F.L.S., P.M., P.P.G.W. N. and E. Yks., P.G.A.D.S. (Eng.) Mark; 30°, etc. In the same way he issued pamphlets on the Acacia, and other aspects of Masonic history.

He was an old member of the British Association for the Advancement of Science, and attended the meetings with great regularity, both in this country and abroad. He very much enjoyed the meetings abroad as giving him opportunities to visit various parts of the empire in congenial company, and of widening his knowledge of, and outlook on, nature. From these expeditions he always returned with mycological collections and observations of considerable interest. He was so modest and unassuming in his demeanour that very few outside the circle of his more intimate friends realized that his was a penetrating and inquiring mind, always curious about the world in which we live, and intellectually appreciative of the wonderful developments of Science.

At the time of his death Mr. Cheesman was President of the British Mycological Society, a position to which he was elected in recognition of his services to Mycology generally, and to the Society in particular, of which he was a foundation member. Unfortunately his prolonged illness prevented him taking any large share in the proceedings of the Society during his period of office, much to the regret of the members, by whom he was much respected. His relations with his colleagues, and especially with those who were beginners in the science he loved so well, were always characterised by the most kindly consideration and sympathetic understanding, and he was always ready to give of his best to those who were anxious to learn. He never obtruded himself in conversation, but on occasions, and with sympathetic friends, he was a most charming companion, and able to contribute his share of interesting fact and fable to the general talk. He was generous in the help which he from time to time gave to scientific projects in which he was interested, and only a short time before his death he had made a donation of £100 to the British Mycological Society as a token of his appreciation of the work of the Society in furthering our knowledge of the fungi.

The death of William Norwood Cheesman removes from our midst a man of sterling worth and attainments, a man whose judgments were respected, and who inspired feelings of affection and confidence. To those of us who knew him well his loss is great, but he has left us with pleasant memories of his many-sided interests, and of his unselfish, sympathetic and kindly friendship.—H.W.

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Prof. D. M. S. Watson describes 'The Structure of Certain Palæoniscids and the Relationships of that Group with other bony fish, in *The Proceedings of the Zoological Society*, 1925, part III. In this paper he figures and describes *Coccocephalus wildi* from the Lower Coal Measures of Trawden, Lancashire; and *Elonichthys binneyi*, and *E. aitheni* from the Dalemoor Rake Ironstone of Stanton, Derbyshire.

## FIELD NOTES.

**A Blue Shark and a Ray's Bream at Filey.**—I found a Blue Shark stranded on Filey rocks on the 4th of December. It weighed 14 pounds exactly, and was 4 feet long. Mr. W. J. Clarke has confirmed my identification, and says that it is a very unusual thing to find the species at this time of the year. A Ray's Sea Bream also was caught here about a fortnight ago with a line with a Dahlia Wartlet Anemone on the hook as bait. I have photographs of both.—J. A. STEVENSON, Filey.

**Galathea strigosa Linn. on the Yorkshire Coast.**—An adult example of this crustacean was recently picked up on the sands at Withernsea by Mr. Drewery, and sent to the Municipal Museum at Hull. The species has previously been recorded on the Yorkshire Coast at Filey by Mr. Petch, at Whitby by Mr. Stephenson, and at Scarborough by Mr. Grabham, who states that it is occasionally caught in the Lobster pots there. The species has also been recorded at Runswick. It is known to the fishermen as the 'Squat Lobster.'—T. SHEPPARD.

**Two Mites New to Yorkshire.**—Two species were omitted from the 'Mites of Yorkshire' (*The Naturalist*, August, 1923, p. 275), as their first discoverer (the Rev. J. E. Hull) had not then described and figured them. He did so in *The Annals and Magazine of Natural History*, Ninth Series, Vol. XV., February, 1925, from other northern examples. They are: *Macrocheles (Nothropholaspis) matrius* Hull, a female from moss, Gawthorpe Green, near Huddersfield, May, 1919; *M. (Nothropholaspis) nemoralis* Hull, a female from debris, Roundhay Park Gorge, Leeds, April, 1919. See also *The Naturalist*, April, 1923, pp. 151-3.—WM. FALCONER, Waterloo, Liverpool, 4th December, 1925.

**Hybernia defoliaria Ch.**—Early in November, 1925, this insect appeared abundantly in the same locality whence I recorded it a year ago (*vide The Naturalist*, 1925, p. 20). On the evenings of the 5th and 6th great numbers congregated around the lit lamps in Dog Kennel Bank. About four o'clock on the morning of the 7th, rain began to fall heavily, and when I passed that way between eight and nine o'clock, the pavement and roadway in the neighbourhood of the lamp-posts were very thickly bestrewn with drowned corpses of this moth. The rain continued heavily for fourteen hours without a break; then for another sixteen hours intermittently. After that I never saw a single specimen of *defoliaria*, and conclude that the heavy rain, followed shortly after by a severe frost, effectively wiped out the brood of males. What happened to the females, and whether they had deposited their eggs before the rain and frost came, remains to be seen.—CHARLES MOSLEY, Huddersfield.

## REVIEWS AND BOOK NOTICES.

**Two Ornithologists on the Lower Danube.** Being a record of a journey to the Dobrogea and the Danube Delta, with a systematic List of the Birds Observed, by H. Kirke Swann, F.Z.S., M.B.O.U., illustrated from photographs taken by J. H. McNeile, M.B.O.U. London: Wheldon & Wesley, Ltd., 2-4 Arthur Street, New Oxford Street, W.C. 2. 67 pp., price 5/-. The illustrations include Nests of the Black Vulture, Imperial Eagle, Goshawk, Penduline Titmouse, Pigmy Cormorant, etc. The paper is normal, and the little book is worth the money.

From Messrs. Hodder & Stoughton we have received two interesting volumes by E. T. Seton. The first, **Raggylug**, and other stories, from 'Wild Animals I have Known' (126 pp., 2/6 net); and the second **Billy**, and other stories, from 'Wild Animal Ways' (128 pp., 2/6 net). These are charmingly produced in the author's familiar style, and the large number of sketches in the text and on plates adds much to the value of the books. The Story of a Cottontail Rabbit, The Springfield Fox, Wully: The Story of a Yaller Dog, and The Pacing Mustang, occur in 'Raggylug'; while The Dog that made Good, Atalapha: A Winged Brownie, The Wild Geese of Wyndygoul, Jinny, and the Taming of a Bad Monkey, appear in 'Billy.'

**Aspects of Science**, by J. W. N. Sullivan. London: R. Cobden-Sanderson, 17 Thavies Inn. 191 pp., 6/-. The author states that the papers which make up this volume have been selected because, although they deal with different aspects of various scientific ideas, yet they do illustrate, more or less, one point of view. That point of view may be described, perhaps as æsthetic, but rather better as humanistic. Scientific ideas have a history; they arose to satisfy certain human needs; to see them in their context is to see them as part of the general intellectual and emotional life of man. What they exist to do they do better than does anything else, and the needs they satisfy are not peculiar to scientific specialists. These papers try to show one or two of the many reasons why, for people who are not specialists as well as for those who are, science may be interesting.

**Memoirs of the Geological Survey, Scotland: The Geology of the Glasgow District.** Revised edition, by H. Macgregor, C. H. Dinham, E. B. Bailey, E. M. Anderson. 300 pp., 7/6. This memoir presents the main outlines of the geology of the area included in the Glasgow District Map—a special publication issued with the memoir in 1911, and including the country between Bothwell and Killearn, Barrhead and Craigannet Hill (above Carronbridge); reference to places beyond the limits of the map has, however, been made where necessary. Intended primarily as an educational handbook, the memoir summarises the local and specialised researches of previous workers, and co-ordinates them with the results of the general revision of the whole area carried out by the Geological Survey mainly between the years 1904 and 1909. The second edition now issued is largely a reprint of the first, but the opportunity has been taken of effecting some rearrangement of the text, and of incorporating the latest recorded discoveries in stratigraphy and petrology which have a bearing on the local geology. The bibliography has been considerably enlarged.

**Economic Geology of the Ayrshire Coalfields: Description of Area I. (Kilbirnie, Dalry and Kilmaurs),** by J. E. Richey, G. V. Wilson and E. M. Anderson. vi.+91 pp., price 2/6. This memoir forms the first of a series to be devoted to a description of the Ayrshire Coalfields. A short summary of the geology of the district is followed by a detailed account of the different formations arranged in geological order. These comprise the Carboniferous Limestone Series, the coals, ironstones and limestones which have been long and extensively worked; the Millstone Grit with its valuable fireclays and bauxitic clay, and the Coal Measures. In the final chapter, building stones,

glass sands, refractory materials, road-metal quarries, etc., are briefly described, and tables of analyses of clays, limestones, sandstones, and ironstones are given in an Appendix. A colour-printed sheet of comparative vertical sections of the North Ayrshire Coalfields (price 2/6) has been published to illustrate this memoir and the corresponding one dealing with Area II. The memoir is illustrated by two plates, and eight text figures, and is provided with a glossary of Mining terms used, and an index. With the following it can be obtained from H.M. Stationery Office, 120 George Street, Edinburgh, or from any Agent for the sale of Ordnance Survey maps.

**Economic Geology of the Ayrshire Coalfields: Description of Area II. (Kilmarnock Basin)**, by **E. M. Anderson**, with contribution by **G. V. Wilson**. vi.+107 pp., 3/-. This memoir is the second of the series, and, with the above, includes the greater part of North Ayrshire. A summary of the geology of the district is followed by a detailed account of the principal formations. This memoir deals mostly with the Kilmarnock Basin of Coal Measures. In parts of the coalfield large inroads have now been made in the Coal Measure coals, but there are seams and areas still unwrought to which attention is directed. The Coals in the Limestone Coal Group are mainly intact and have been reached in several instances by boring. They are, however, fewer than in the corresponding group in Area I., and cannot be regarded as forming any very large reserve.

**Prometheus: or Biology and the Advancement of Man**, by **H. S. Jennings**. London: Kegan Paul, Trench Trubner & Co., 94 pp., 2/6. Under this heading the Professor of Zoology at the John Hopkins University discusses heredity and environment, genetics and other problems connected with the advancement of man, dealing with the subject from a biological point of view. The little volume is excellently printed and produced.

**The Axe Age: A Study in British Prehistory**, by **T. D. Kendrick**. London: Methuen & Co., xii.+177 pp., 6/- net. Under this title, Mr. T. D. Kendrick brings together a series of chapters dealing with 'The Word Neolithic'; 'The Long Barrows'; 'The Porthole Entrance'; 'The Megalithic Idea'; 'The Date of the Long Barrows'; 'The Dawn of the Axe Age'; 'The Eochalcic Episode.' Some little time ago the author undertook a survey of the megalithic monuments of the Channel Islands, and this has given him an interest in Prehistoric Man which has resulted in the present volume appearing. At the moment he seems chiefly concerned with 'a special stage in the development of primitive cultures in Europe whose study has, to a certain extent, been embarrassed rather than helped by the original ordering of the subject; for, although continued experiment and research has approved such a simple beginning as the fundamental division of the whole dim era into three ages of stone, bronze and iron, according to the materials successively exploited by early man, and has provided numerous sub-periods and transitional stages, and explained these by various ingenious theories of folk-wanderings, armed invasions, or the less adventurous traffic of commerce, nevertheless in one respect the expansion of this elementary classification has not proceeded with anything like the assurance that has obtained elsewhere. This period, in so great a need of elucidation, is the latter part of the Stone Age.'

**Science and Scientists in the Nineteenth Century**, by **R. H. Murray**. London: The Sheldon Press, xvii.+450 pp. 12/6 net. In these days of extraordinary advantages in various branches of Science it is too frequently forgotten what great work many of the pioneers accomplished in view of the many disadvantages under which they suffered. Recent researches in various ways as the result of improvements in optical instruments, etc., have enabled discoveries to be made which could not possibly have occurred in early times. It is just as well,

therefore, now and again to bear in mind the work of the early scientists. In the present substantial volume, Dr. Murray gives a series of ten essays dealing with Jenner and Vaccination ; Simpson and Chloroform ; Lyell and Uniformitarianism ; Helmholtz, Joule and the Conservation of Energy ; The Precursors of Darwin ; Darwin and Evolution ; Pasteur and Microbes ; Lister and Antiseptics ; Forgotten Scientists ; and Limitations of Scientists. In addition there is a bibliography ; and a Preface by Sir Oliver Lodge.

**Religion and Natural Science**, by **E. Haigh**. London : Student Christian Movement, 32 Russell Square, W.C.1. xi.+170 pp. Cloth cover, 4/6 net. Paper cover, 3/- net. As a worker in secondary education for over forty years the author addresses this volume to students of natural history in the hope that it will enable them easily to get a grasp of the question of the relationship of religion to science without having to peruse the wealth of material available in the larger text-books. The chapters are :—Mainly about Definitions ; Natural Science and Religion ; Natural Science and the Bible ; The Conflict of Science and Religion ; Evolution ; The New Psychology and Religion ; Human Power over Matter ; 'Laws of Nature' ; The Place of Theory in Science ; Religious Difficulties ; A Scientific Parable ; Nature a Divine Revelation ; The Theistic Outlook on Nature.

**The Salmon : Its Life Story**, by **W. J. Menzies**. London : Wm. Blackwood & Sons. xii.+211 pp., 21/-. Lest the readers should presumably get the impression that this is a collection of fish stories, the author informs us that he has endeavoured to make it 'an accurate record of facts.' He is the Assistant Inspector of Salmon Fisheries for Scotland, and has taken a prominent part in the various scientific investigations which have taken place in recent years by marking salmon, by examining their scales, and thus solving problems of age by the indications given on the scales, of spawning, etc. Throughout, the volume is well illustrated by photographs and diagrams, particular attention being given to enlarged photographs of scales which resemble nothing so much as huge finger-prints. In a thoroughly scientific manner the author deals with Spawning ; Kelts ; Smolts ; Grilse ; Spring Salmon ; Summer Salmon ; Previously Spawmed Salmon ; Migrations in the Sea ; Condition ; The Possibility of Local and Season 'Races.'

**Johnny Bear** and other stories from Lives of the Hunted, by **E. T. Seton**, Being the Personal Histories of Johnny Bear Tito ; Why the Chickadee Goes Crazy. London : Hodder and Stoughton, 124 pp., 2/6. A delightful series of stories of a teddy bear whose 'whole appearance suggested dyspepsia,' and others. There are many quaint illustrations incorporated within the text, and the book is admirable as a gift for a very young naturalist.

**An Introduction to Historical Geology**, with special reference to North America, by **William J. Miller**. London : Chapman & Hall, Ltd., xvi.+399 pp., 13/6 net. The fact that a second edition of this volume has been called for is some evidence of its popularity. The book is more devoted to general principles of Historical Geology and physical geology than to Palæontology, in this way differing from the usual type of work dealing with geology from this point of view. At the same time much is said with regard to the extinct faunas of different parts of the world. There is a wonderful series of illustrations, diagrams, etc., which help to make a very readable narrative, particularly to those interested in America.

**My Wonder-World : A Nature Lover's Paradise**, by **S. M. Emmanuel**. Cambridge : Messrs. W. Heffer & Sons, Ltd., xiii.+266 pp., 7/6. The author is well known to readers of *The Catholic Fireside* and other similar journals, and has gathered together various articles which she has written for the children. The stories are more after the type of fairy-tales, and deal in a delightful way with birds, bees and

other things. There are some beautiful illustrations from drawings by 'A.C.D.'

**Mystery Cities : Exploration and Adventure in Lubaantun**, by **Thomas Gann**. London : G. Duckworth & Co., Ltd., 252 pp., 21/- net. The author describes his experiences in British Honduras, where he spent some time in exploring the remains of the ancient civilisations to be met with there. The volume is illustrated by photographs of various interesting antiquities from flint implements to pyramids, and there is much information about the Fauna and Flora of the area. Of the sixteen chapters, full details are given in the Contents, and possibly the following copy of 'Chapter 2' heading will give a more graphic idea of the nature of the narrative :—' Park-like scenery—A narrow escape—Miserable Indians—Disgusting hammocks—A village of criminals—Earth-eating children—Prevalence of hookworm—A dangerous night-ride—Lost in the bush—A miserable plight—Protection against mosquitoes—Adventure with a snake—Horses' instinct superior to human intelligence—Arrival at Cayo—Doctor's visit welcome—Native fees—A curious superstition—A cure for immortality—A post-mortem feast—Cowardliness of Central American tiger and lion—Story of Marcelino Velasquez—His battle with a jaguar.'

**The Aquarium Book**, by **E. G. Boulenger**. London : G. Duckworth and Co., 208 pp., 10/6 net. This volume is still another result of the new Aquarium at the Zoo, and is illustrated by a number of photographs of the occupants of the different tanks there, as well as several sketches giving anatomical and other details of the occupants, by L. R. Brightwell. In his introduction the author describes the methods of construction of the tanks, and then follows an account of their contents.

**Nature Pioneers of the Insect World**, by **Joseph Ritson**. London : H. R. Allenson, Ltd., 173 pp., 3/6. This volume contains 'Suggestions for addresses to children and young people,' and while the various species dealt with may not be familiar to English children, the tale is nevertheless written in an interesting manner. The species are referred to under the headings of the insects in Agriculture, Manufactures ; Industry ; Social Organisation ; Communication ; Sanitation and Parasitism.

**Tramps Across Watersheds**, by **A. S. Alexander**. Glasgow : J. Smith & Son., Ltd., 57-61 St. Vincent Street, xiii.+304 pp., 7/6 net. This book contains a reprint of a series of interesting articles dealing with the natural history of well-known parts of Scotland, which originally appeared in *The Scotsman* and *The Ayrshire Post*. The author deals with the areas he has visited from many points of view, geographical, natural history, geological, etc., and while his chapters are well written his far too frequent and totally unnecessary use of italics makes a perusal of the volume a little irritating.

**An Introduction to Palæontology**, by **A. Morley Davies**. London : T. Murby & Co., xiii.+414 pp., 12/6 net. The publishers in this case have been particularly successful in securing the services of Dr. Morley Davies in the preparation of a well-known work, which will at once appeal to students. This being the second impression, Dr. Davies takes the opportunity of replying to some of the criticisms of his earlier edition, which appeared only five years previously.

**Geological Survey**, Sheet 45 (Iona and S.W. Mull), published 1925. This Sheet is a fine example of colour printing, quite apart from its geological interest. The district mapped is S.W. Mull, with the adjacent islands of Ulva, Gometra, Iona, Staffa, etc. It appeals perhaps most of all to the student of Tertiary Volcanic activity. The chief rock of the area is Basalt, which occurs in sheets, which give rise to terraces, and the contours of the area approximate very closely to the outer edges of these sheets. This Basalt is contemporaneous with that forming the Giants' Causeway, and the Fingal's Cave in Staffa.

Associated with this outpouring of lava in the Tertiary Period, are sills, dykes, sheets, and plugs, and the position of these is clearly shown. The area, though not large in extent, exhibits great geological range, commencing with Lewisian Gneiss and finishing with recent blown sand. The Isle of Iona shows a Pre-Cambrian series of Lewisian Gneiss and Torridonian strata, while in S.W. Mull a wedge of Moine schists (pre-Cambrian) occurs between Tertiary Dolerites on one hand and a granite boss of Lower Old Red Sandstone Age on the other. The Tertiary Rocks occur in small patches, and comprise Triassic, Rhætic, Lower Liassic and Upper Cretaceous deposits. The hiatus between Lower Lias and Upper Cretaceous is the same as that which occurs in Arran, and also Market Weighton in E. Yorkshire. The predominant Tertiary volcanics are next succeeded by Pleistocene and then recent deposits, indicated clearly, and included also are the pre-glacial coastline above 100 feet, raised sea margins, the 100 feet raised beach, intermediate raised beaches, and the main 25 feet raised beach. A very large amount of explanatory matter is incorporated in the map, while the below-sea level contours of 200 feet to 25 feet, showing the existence of a submarine platform supporting many scattered sunken islands, and just below the surface to the west of the area, form a striking feature. Issued simultaneously is the Memoir to the area, by E. B. Bailey, E. M. Anderson and others. H.M. Stationery Office, price 3/-.—A.C.

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W. Leach writes on 'The Vegetation of the Derwent Fells, Cumberland,' in *The Proceedings of the Birmingham Natural History and Philo-sophical Society*, Vol. XV., Part 4.

*The Transactions of the Cardiff Naturalists' Society*, Vol. LVI., are principally occupied by a paper on 'Glamorgan: Papers and Notes on the Lordship and its Members,' by the late John Stuart Corbett, whose portrait appears as frontispiece.

*The Isle of Wight Natural History Society* is to be congratulated on the prompt appearance of Part V. of its first volume of *Transactions*, which contains many valuable records, and important papers on the Alien Plants of Hampshire and the Isle of Wight; the Upper Headon Beds of the Island; Meteorological Notes, etc. (pp. 210-312, 3/-).

The Library Association has published an admirable 'Subject Index to Periodicals,' the part 'B-E. Historical, Political and Economic Sciences' (London: Grafton & Co., 212 pp., £1 1s. net) being before us. It is well arranged, printed with admirable type on suitable paper, and must be of tremendous value to Librarians and others.

We have received Bulletin No. 14 of *The Bureau of Bio-Technology*, issued by Messrs. Murphy & Son, Ltd., of London, Leeds and Nottingham. It contains the following valuable contributions:—'The Effect of Pressure on Yeast Cells, with some Remarks thereon,' by F. A. Mason; 'Production of Sound Beer with the Minimum Preservative,' by Geo. Jones; and 'pH Values and the Use of the Comparator in Brewing,' by F. A. Mason.

*The Proceedings and Transactions of the Croydon Natural History and Scientific Society* (Vol. IX., Part 4, 187-224 pp., 5/- net) contain as frontispiece a remarkably good portrait of the late W. Whitaker, F.R.S., who lived at Croydon and always took a keen interest in the Croydon Society. The volume contains a record of the Society's activities, with the Presidential Addresses of Mr. G. M. Davies, dealing first with 'Geology and Lines of Transport in the Croydon District,' and secondly 'The Sea in Surrey.' Mr. F. Campbell Bayard gives his usual Meteorological Reports, and the Society must be congratulated on being able to print the details so thoroughly.

## NORTHERN NEWS.

We notice the editor of a contemporary states 'As a whole we are not sorry to see Wembley go.'

A report of Dr. H. Wager's address on 'Heredity and Variation,' appears in *The Report of the Yorkshire Natural Science Association* for 1924-5.

We learn from the press that 'a blackbird, with beautiful plumage of black and white, was seen at North Cave, East Yorkshire, early in December.'

We are glad to learn that the Leeds Museum has at last opened its doors on a Sunday, and that 360 visitors were admitted on a recent Sunday afternoon.

It is reported that a live seal was discovered on the North Sands, Hartlepool, early in December, and captured. It was sold on the Hartlepool Fish Quay for 11s. 6d. to a Darlington fish merchant.

The Annual Meeting and Excursion of the British Bryological Society will be held at Ingleton during Whitsuntide, 1926, full particulars of which may be obtained from Mr. W. H. Burrell, 44 West View, Horsforth, Leeds.

At a recent meeting of the Linnean Society, Dr. G. Claridge Druce exhibited a series of specially interesting British plants, some shown for the first time since their discovery; species belonging to *Taraxacum*, *Thymus* and *Anthriscus*.

Our contributor, Mr. T. Petch, B.A., B.Sc., who for many years has held an important appointment in the Botanic Gardens, Peradeniya, Ceylon, and recently retired, has just been engaged to establish a Tea Research Institute there.

According to the press 'a whaler, whose plates had been pierced, was saved by a large fish which was drawn into the hole by the inrush of water and got jammed there. The fish only became dislodged when they were nearly in port.' This is aptly described by *Punch* as a 'Caulker.'

As Bulletin No. 6, The Forestry Commission has issued *The Phomopsis Disease of Conifers*, by Malcolm Wilson (London: H.M. Stationery Office. 34 pp., 1/6 net). We must congratulate the Commission on the excellence of the Report, with its wealth of illustration, which should do much towards preventing the loss due to the neglect of our forest trees.

In *The Hebden Bridge Times* for October 30th, Mr. S. Fielding records a bunch of freshly set clover on the canal side; 'after the old flowers have all been fertilized, and so withered and drooped, a sort of second floralin has occurred in them, and from the very centre of such old flowers a second stem bearing another flower—glomerule—has arisen, but only half the size of the first head of flowers.' In the same paper, under the head of 'Forty Years Ago,' we learn that Mr. Fielding gave classes in geology and botany, and there is a report of an amusing case where the secretary of the Hebden Bridge Mechanics and Scientific Institute endeavoured to sue a member for arrears of subscription.

We take the following from the press, as printed, though we cannot afford the space for the various head-lines, etc.:—'POOR FISH! A What-is-it with Sad, Sad, Eyes. *Evening News* Telegram (From our own Correspondent)—Buenos Aires, Wednesday. A curious amphibian has been discovered in the province of Santiago del Estero. It has a kangaroo-like body, a fox-like fur, a cat-like face, and cow-like eyes with a sad expression. It roams at night and eats anything. It climbs dexterously and dives like an otter. The species is unknown. Zoologists are puzzled.' We would suggest that the *Evening News* sends a representative to the Zoo where he will see animals very like those described, but they are neither *fish* nor *amphibians*!

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# YORKSHIRE NATURALISTS' UNION.

## VERTEBRATE SECTION.

*President of the Section:* F. H. EDMONDSON, Keighley.

Two meetings will be held in the Library of the Leeds Philosophical Society on **Saturday, February 20th, 1926, at 3-15 p.m. and 6-30 p.m.** Papers will be given as follows:—

'The Water Vole in relation to Prehistoric Man,' by F. J. STUBBS.

'Some Notes on the Farne Islands' (illustrated), by RILEY FORTUNE, F.Z.S.

'Some Books about Birds' (illustrated), by Dr. J. S. GAYNER.

Members or Associates are invited to attend and bring notes, specimens and lantern slides.

Will Officials of Affiliated Societies kindly notify their members.

E. WILFRED TAYLOR, *Hon. Sec.*,  
10 Telford Terrace, York.

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## NOTES AND COMMENTS.

## A FISH STORY.

We learn from the press that 'Mr. C. Clarke, of Watersfield, Sussex, was recently riding his motor-bicycle through a flooded road—a large part of the Run Valley is in flood—when he felt something strike his wheel. On examining it he found that a fine sea trout had crashed into the wheel, with the result that its head had been cut clean off. He found the body, which weighed 9 lbs, and provided him and his family with several good meals.' For years we 'took off our hats' to Sussex for the way in which that county exceeded all records for new species of birds 'seen in the flesh,' until we exposed the method, and now they catch giant sea trout already prepared for the table!

## NORTH SEA HERRINGS.

The Ministry of Agriculture and Fisheries has issued Part II. of 'Investigations into the Age, Length and Maturity of the Herring of the southern North Sea,' by William C. Hodgson, of the Fisheries Laboratory, Lowestoft.\* By the aid of innumerable statistics, several particularly clear and valuable diagrams, and reports and information derived from this work, the varieties of herring met with, their distribution, etc., are described. It seems that the growth of the herring in the English Channel during certain seasons is greater than that off the Northumberland coast. The investigations include those on the Northumberland, north Yorkshire, Humber, and southern Bight areas. The whole report is full of useful suggestions, and is worthy of the attention of the naturalist.

## ORDERS FOR SWANS.

*British Birds* for January is almost entirely occupied by a very interesting 'Historical Review of the Laws, Orders, and Customs anciently used for the Preservation of Swans in England,' by N. F. Ticehurst. This includes a set of orders made in the Court of the Swain-mote of the manor of Hatfield for the keeping and preservation of swans on Hatfield Chase. This is taken from Hunter's 'South Yorkshire.' Further 'Orders and Paynes of the Court of the Manor of Hempholm to be observed by Swanners' (1708) are quoted from Poulson's 'History of Holderness.'

## BRITISH FOSSIL INSECTS.

The British Museum (Natural History), London, has issued two monographs dealing with Fossil Insects; No. 1 referring to the British Liassic Dragonflies (Odonata), by Dr. R. J. Tillyard (40 pp., 5/-), the specimens being drawn

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\* H.M. Stationery Office. 48 pp., 6/6 net.

from Leicestershire, Warwickshire, Worcestershire, and Gloucestershire. No. 2 deals with insects from the Coal Measures of Comentry, by Dr. H. Bolton (56 pp., 5/-). The latter describes a collection given to the British Museum by Mr. Henri Fayol. Both publications are well illustrated by excellent plates.

WILLIAM SMITH.

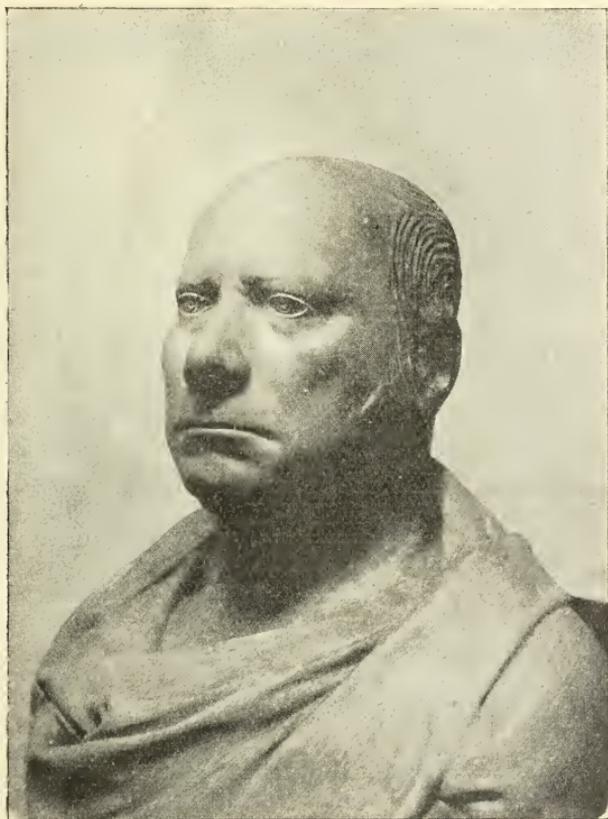
In the Scarborough Museum is a bust of William Smith,



Photograph of bust of William Smith in St. Peter's Church, Northampton.

taken from life by the late J. R. Baker, of Scarborough, which was the only example known. As it differs so much from the bust of Smith in St. Peter's Church, Northampton, which was prepared after Smith's death (apparently from the en-

graving in Phillips's 'Life of William Smith'), it seems desirable that in case of accident a copy or copies should be made. With the permission of the Scarborough Philosophical and Archæological Society, therefore, a mould has been made



**Photograph of bust taken from life by J. R. Baker,  
now in the Scarborough Museum:**

*Photo by Dr. J. Irving.*

from this bust, and a replica is now on view in the National Museums and in the Museum at Hull.

#### ENEMIES OF TIMBER.\*

The recent serious damage to numerous buildings, and the consequent expense of repair, has brought particularly prominently to the custodians of our ancient buildings the havoc wrought by animal and plant life, principally beetles and dry rot, in connection with the timber-work. The author of the present book deals thoroughly with the life histories

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\* 'Enemies of Timber: Dry Rot and the Death-Watch Beetle,' by Ernest G. Blake. London: Chapman & Hall, xvii.+206 pp., 12/6 net.

of the beetles which are most harmful, describes in detail the cause and effect of dry rot, and, what is of more importance, gives useful advice as to methods to be adopted to combat the trouble.

NORTHERN DINOFLAGELLATES.\*

For many years the valuable contributions to Marine Biology by Dr. Marie V. Lebour have been commented upon in these pages, and in her new work she has brought to a magnificent conclusion her various researches on the minute forms of marine life known as Dinoflagellates. A short description is given of each species, and, when possible, a figure drawn from nature: when these drawings could not be obtained, figures copied from those of other workers are used. All the illustrations, except when otherwise stated, are by the author. These original figures are drawn as nearly as possible to scale, and occupy the plates. Other figures taken from different authors are placed in the text, and are of various magnifications. Hitherto the literature dealing with this difficult branch of natural history has been scattered, but students now have, in a compact form, a monograph which is likely to answer their needs for a considerable time to come. We should like to congratulate both Dr. Lebour and the Plymouth Biological Station on the production of this useful volume.

CIRCE'S WORSHIPPERS.†

The building beaver leaves his toil,  
 The lion stills his regal roar,  
 The seal forgoes his silver spoil  
 To greet you—they were men before  
 You snared them in the storm-dark hair  
 That shades wise eyes of clear sea-blue  
 And neck beyond all lilies fair,  
 Circé! And still they worship you.  
 By field or flood, beneath your spell  
 Past mortal strivings they despise,  
 Happy that they shall ever dwell  
 Within the magic of your eyes.

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Dr. Wilfrid Robinson refers to 'Proliferation and Doubling in the Flowers of *Cardamine pratensis* (L),' and Mr. J. W. Jackson to 'The Occurrence of *Conularia* in the Carboniferous Limestone of North Wales,' in *The Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, Vol. 69, just received.

\* 'The Dinoflagellates of Northern Seas,' by Marie V. Lebour. Plymouth: Marine Biological Association, vii.+250 pp., 12/6 net.

† From 'Circé's Worshippers and Other Poems,' by Frank Finn. London: Selwyn & Blount, 16 pp., 1/-

## LIGHT UPON GROWTH.

J. H. PRIESTLEY, D.S.O., B.SC., F.L.S.

(*Being the Presidential Address delivered at Huddersfield,  
December 5th, 1925.*)

IT is impossible for a Botanical President to commence his address this year without reference to the grievous loss that Yorkshire Botany, and particularly the Mycological Committee of the Union, has suffered through the passing, first, of Alfred Clarke, and then of W. N. Cheesman. A very happy account of the life of Alfred Clarke, spent to the end in the service of that study of natural history he did so much to promote, appears in *The Naturalist* for March from the sympathetic pen of F. A. Mason. This is not the place in which to attempt to chronicle the distinguished services to science of W. N. Cheesman, who, at his death, held the post of President of the British Mycological Society. This flourishing Society, in which the activities of mycologists throughout the whole country, both professional and amateur, has found expression within recent years, was founded at Selby in 1896, at a foray under the auspices of the Union, at which both Clarke and Cheesman were present. As one of the founders of the British Mycological Society, Mr. Cheesman took great interest in its success, which has been great enough to justify fully the efforts of the little group of mycologists gathered at Selby nearly thirty years ago. In our memories will live many happy recollections of cheerful comradeship in the field and wise council in the problems of determination subsequently. The lives of such men, spent in unselfish service of their fellows, and in their chosen scientific pursuits, are the best evidence to us that the time we give to the study of natural history is not time lost, and are reminders that if we would gauge the full result of our activities we must look to the reaction of the study of nature upon our own lives and characters.

On the present occasion, you will perhaps permit me, as a student of nature whose viewpoint is primarily physiological, to take up with you the study of some very simple facts of observation which will be familiar to all. I propose to consider the peculiar form and structure exhibited by many plants when grown in darkness, and the changes produced when these plants are exposed to light. But I wish to treat these familiar facts as an example of the contrast of two tendencies in the interpretation of nature which are much in evidence to-day.

### LIGHT UPON GROWTH.

Ever since the acceptance of Charles Darwin's view of natural selection as one of the principal factors in evolution,

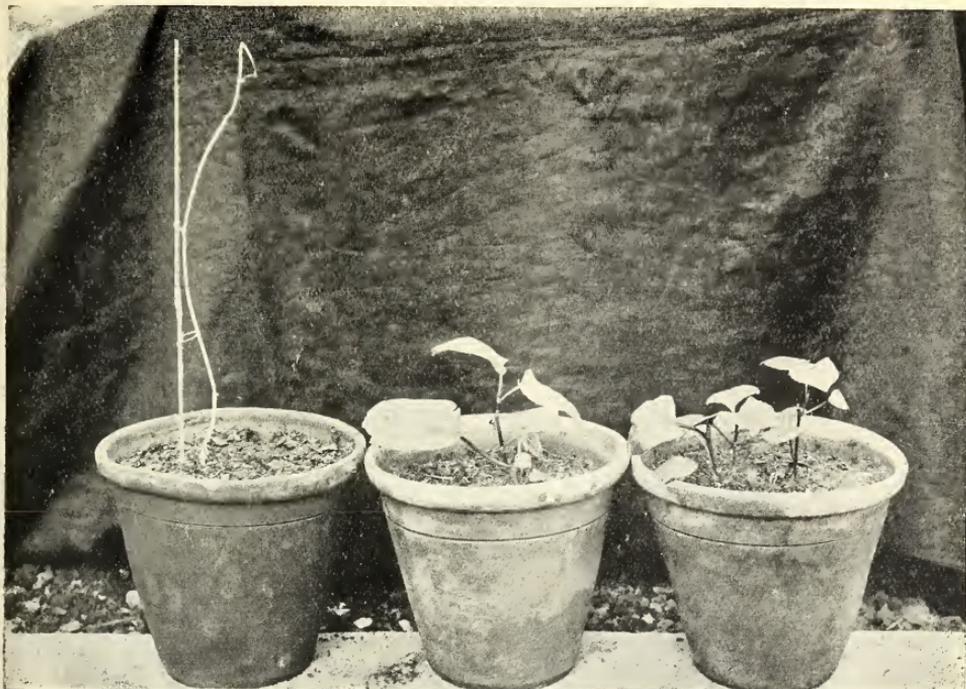
it has been customary to explain particular habits and structures in plants in terms of purpose—as the natural result of fitness to their environment. Around this teleological standpoint a mass of uncritical data has been accumulated, without quantitative proof, and generally without experimental examination, based often solely on a guess as to the imagined needs of the plant. Accustomed as everyone has become to this interpretation, an interpretation eminently suited to popular expression, it is being gradually realised that it in no way furthers a true knowledge of the plant, but, in fact, constitutes a very unsatisfactory blind alley—a lumber room, where inexplicable phenomena are labelled with a suitable purpose, and then left to one side. Recently some of these neglected data have been re-examined from another point of view, in which such plant structures are regarded as the product of the inter-reaction between the potentialities present in the germ cell and the environment in which development takes place ; and the attempt is made, by critical observation and experiment, to disentangle what is inherited from the results of the conditions during development. Such a causal interpretation is not of necessity antagonistic to the traditional teleological view, but is essential to a fuller and truer understanding of plant organisation.

The remarkable changes in form and structure, which certain plants undergo when grown in darkness or ‘ etiolated,’ as compared with their normal appearance when grown in the light, have been known from the earliest times ; and the two methods of interpretation can be sharply contrasted in relation to these phenomena.

#### THE PHENOMENA OF ETIOLATION.

The phenomena of etiolation are by no means always the same for every species, but to bring the problem into practicable compass, it is here restricted to such common types as the broad bean, pea and potato, characteristic of many other Dicotyledonous plants when grown in darkness. These plants all show when grown in darkness (Plates II. and III.) very much elongated stems, very reduced leaf development and the absence of green colour, due to the non-formation of chlorophyll. Frequently the tip of the stem is much incurved, a retention in the case of seedlings, of the original form of the shoot while in the seed and known as the plumular hook ; though shoots not grown direct from seed show it too, as in the case of potatoes (fig. 1) and shoots from cut-down root stocks (Plate I., fig. 1).

According to Godlewski (5) and Francis Darwin (3), by whom the case has been well argued from the teleological standpoint, growth in darkness in nature, means growth in a

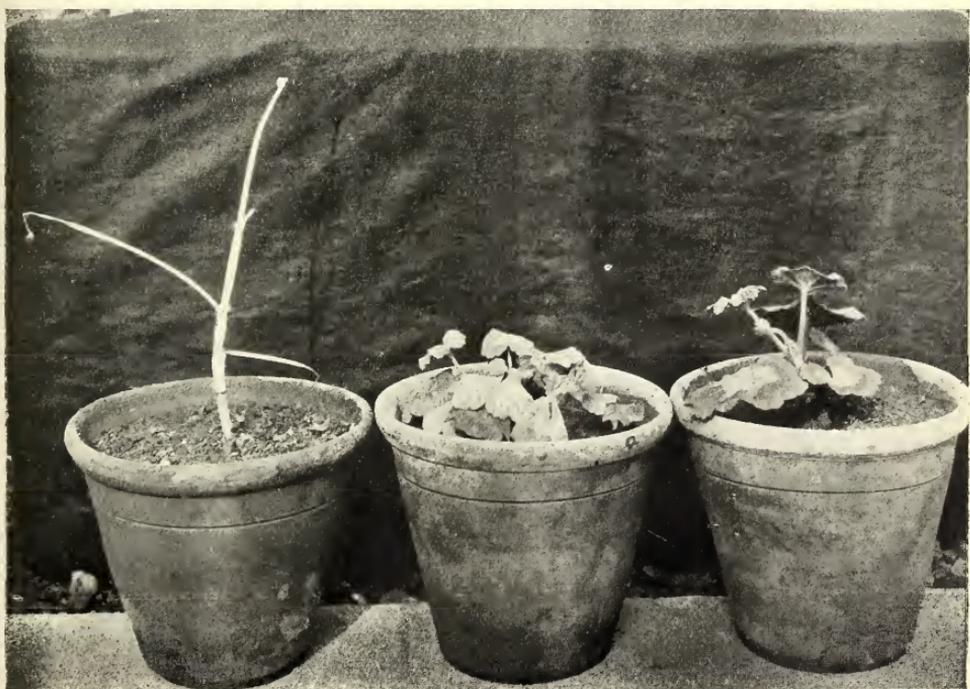


Dark

2 hours

5 hours

Fig. 1.—*Polygonum cuspidatum*, grown from root stock.



Dark

2 hours

5 hours daylight

Fig. 2.—*Pelargonium*, grown from root stock,



greater depth of soil than usual, and the type of stem so produced will bring the shoot more rapidly to the surface of the soil and to the light, without undue waste of energy in the too-previous and unnecessary production of leaves. It is further suggested that during this passage through the soil, the risk of abrasions and the pressure of the soil is borne by the arch of the curved plumular hook, which so protects the delicate growing apex of the plant from damage (4, *loc. cit.*, p. 87, a citation from Haberlandt, 1877). This view neither admits of experimental attack, nor solves the problem as to why many plants when grown in the dark form no plumular hook.

The causal interpretation which follows rests upon ob-

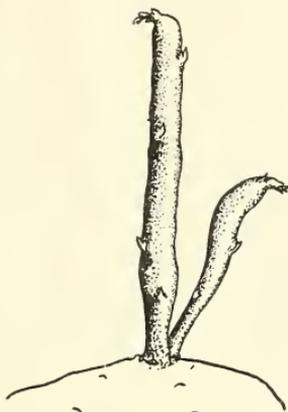


FIG. 1.—Etiolated sprout on potato tuber, showing hooked apex.

servation and experiment, and as the phenomena of growth, whether in light or darkness, are extremely complicated, the statement cannot be so brief and it is necessary first to point out some of the characteristics of normal growth.

#### GROWTH OF THE NORMAL PLANT.

The method of growth in the higher plant is entirely different from that of the higher animal, where growth takes place throughout the whole body, and where the various parts laid down in the embryo advance in size and complexity together. In the plant, growth is restricted mainly to two opposed apical meristems, the results of whose respective activities are the shoot and the root. Although shoot and root differ so much in form and structure, differences between the apical groups of dividing cells, from which they were originally formed, and which are known as the meristems, are not easy to detect. Both are composed of cells which look

exactly alike ; each a small dense mass of protoplasm, surrounded by a thin wall, actively engaged in the synthesis of more protoplasm, thus adding to its bulk until it reaches a certain size, when it divides again to give rise to two precisely similar cells.

And yet there *must* be profound differences between such cells in the meristems of shoot and root because they give rise to such different structures. One difference which can readily be seen between them is the distribution of these

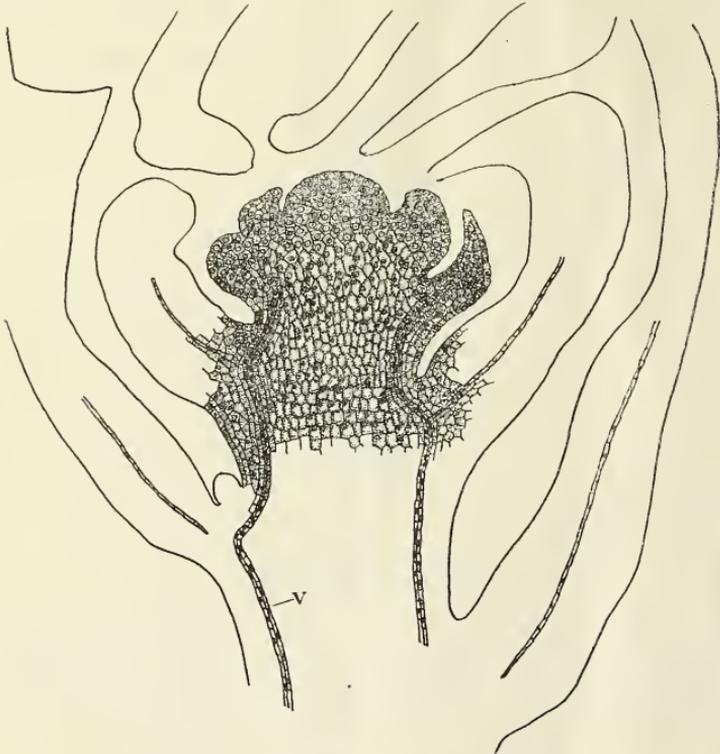
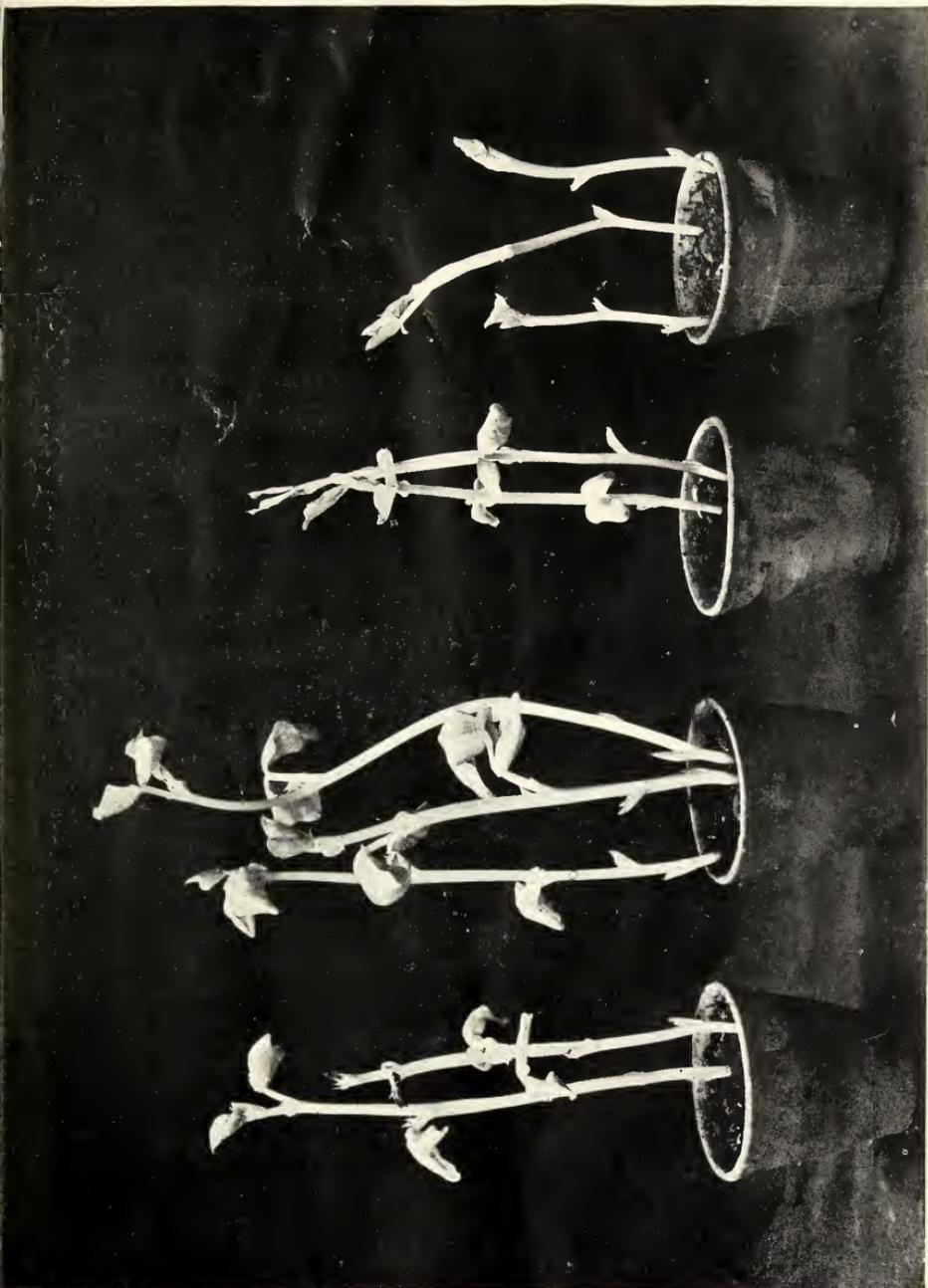


FIG. 2.—Diagram of longitudinal section of apex of normal broad bean shoot, showing distribution of meristematic (densely shaded) cells over surface of shoot. V, position of vascular bundle or procambial strand which precedes it in development.

active meristematic cells at either growing point. Those of the shoot lie just at the surface of the apex (text fig. 2) ; those of the root lie embedded some distance below (text fig. 3). It has recently been pointed out that these differences may be associated with differences in the nature of the walls of the cells, the first products of the living protoplast on which analysis can be attempted by the present inadequate methods. In the case of the shoot meristem the walls consist mainly of



Daylight, 4 minutes daily

2 minutes daily

1 minute daily

Continuous darkness.

Broad Bean (*Vicia Faba* L.)



cellulose and pectin, that is to say, of carbohydrates. In the case of the root meristem the walls seem to be cellulose, with

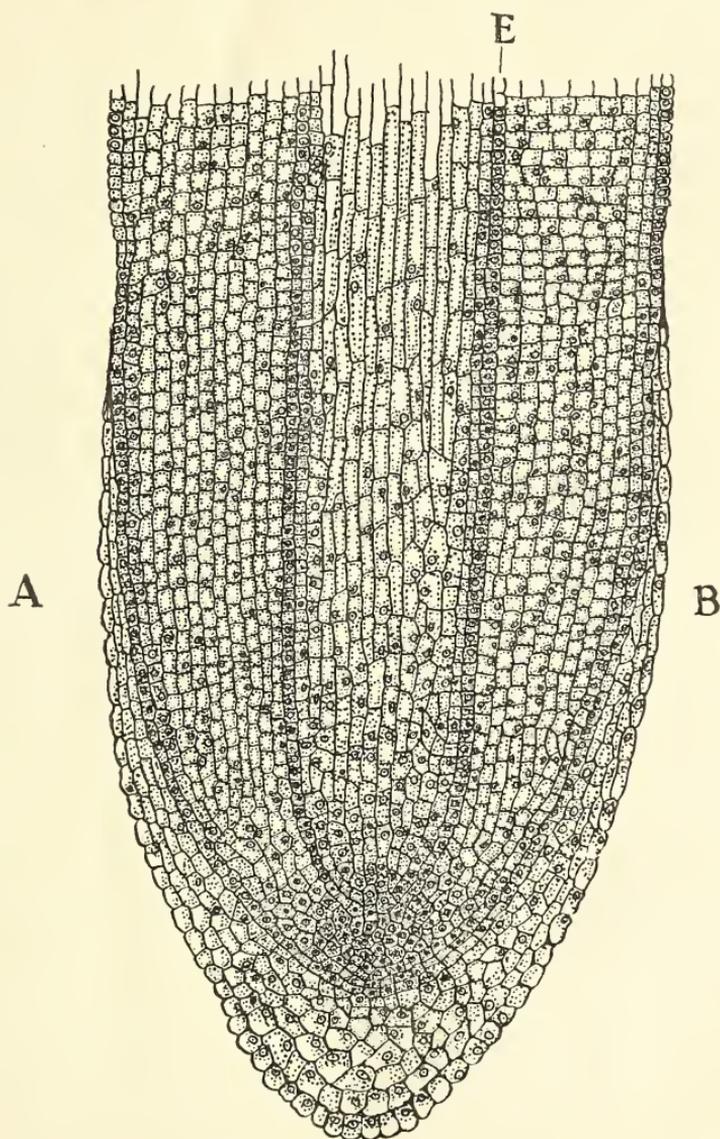


FIG. 3.—Diagram of longitudinal section of broad bean root, showing meristem cells sunk in the tissue of the apex. E, position of endodermis.

less pectin, but associated with much more protein and fat (12).

These differences in the walls may be very significant when it is remembered that each meristem cell is actively

synthesising protoplasm. This is probably why it is such a small cell, because it must have a large surface relatively to its bulk, and over all this surface it must take in the food material necessary to this synthesis. These food materials undoubtedly move about the plant in the vascular channels which terminate some little distance from the meristem ; the intervening distance is bridged by a network of walls enclosing the protoplasts that have constructed them. The nature of this food supply is little understood, but it includes such water soluble substances as sugars and salts, and these must diffuse to the protoplasmic surface of the meristem cell along the walls. Now the walls of the shoot, mainly of carbohydrates, have somewhat the consistency of blotting paper, and when thoroughly saturated with water, soluble substances will readily diffuse along them. It is otherwise with walls which include much fatty substance and protein ; that is, walls which partake more of the nature of protoplasm itself. Very little is known about protoplasm, but there is certainly adequate evidence that it opposes considerable resistance to the diffusion of both sugars and salts. It is at least, then, a suggestive fact that a predominantly carbohydrate wall is found in the shoot apex, associated with a free growth of meristem cells at the surface of the shoot, whilst in the root, the presence of protein and fats in the walls which restrict free diffusion, is associated with an active meristematic growth in the inner layers of cells nearer the vascular supply. The cells at the outside of the root tip indeed fail to continue growth, and are then added to the root cap (text fig. 3). But these differences of distribution are certainly connected with the different appearance of these two apices. The shoot apex, growing freely at the surface, is thrown into folds of meristematic tissue which separate below the apex as the initials of leaves and branches ; thus these members of the shoot are superficial (exogenous) in origin ; the root tissues, however, added to from within the apex, continually add to the length of the root, and no superficial folds appear on the surface.

It would appear that the fatty substances retained in the wall of the meristem cells of the root have been present in the walls of the shoot meristem also, but instead of remaining there they migrate immediately to the surface of the shoot, where they unite into a thin but very important film of fatty substance, the cuticle (6). In the root these fatty substances are never allowed to migrate freely ; there is never a cuticle, but instead, fatty substances in certain of the inner walls are oxidised and changed to a varnish-like consistency, and thus an inner cylinder of cells, the endodermis (text fig. 4) have their protoplasmic contents surrounded on all sides by a varnished strip of wall, the Casparian strip. This layer may

be likened to a chimney, made of protoplasmic bricks set in an unbroken matrix of varnish. Both protoplasm and varnish prevent the free flow outward of water, although water or

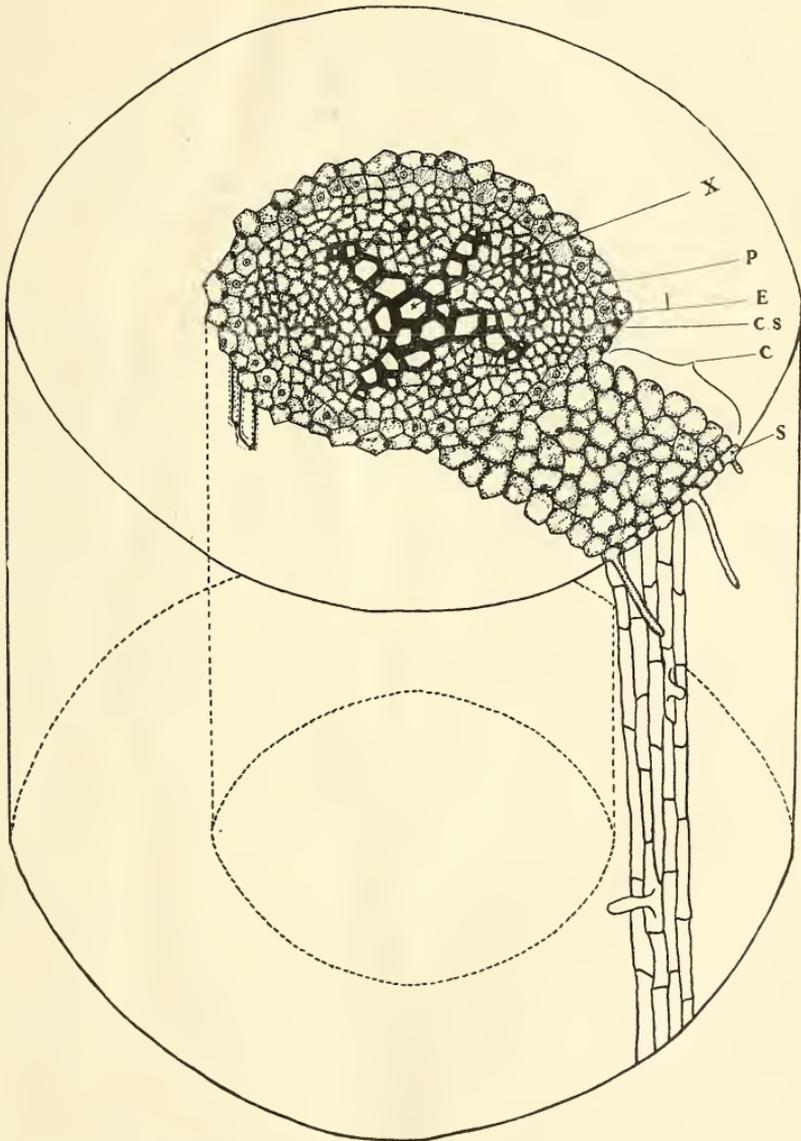


FIG. 4.—Diagram of appearance of young root (of broad bean) as seen in transverse section. The outline of the endodermis (E) is projected longitudinally to show how it forms an unbroken cylinder within the cortex (C). X, Xylem; P, pericycle; C.S., Casparian strip; S, piliferous layer projected longitudinally also, showing insertion of root hairs.

salts may diffuse in or out of the protoplasm, and it has been pointed out that this structure explains why root systems are

able to develop a pressure of sap (II), and also why new root initials, which require nourishment from the substances in this sap, must arise within this cylinder, and so branch roots are endogenous in origin (7).

A root tip, as it grows, seems indifferent to its external surroundings; in darkness or in light it grows in much the same manner, and the structure resulting from its activity, the root, is little altered. In view of the fact that the cells actively dividing and growing are sunk in the tissue of the root this is perhaps natural, but the facts are different with the superficial meristem of the shoot. When this is grown in darkness the phenomena of etiolation result.

(*To be continued*).

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**Osmunda Regalis in Cheshire.**—In the 'Flora of Cheshire' several stations are given for the Royal Fern, and these are prefaced by the remark that it grows in 'the trenches on and adjoining peaty mosses . . . but evidently the remains of an old marsh flora. . . . Fairly diffused in the inland lowlands.' There follow detailed localities of which those for the Nantwich district have most interest. It was recorded for Wybunbury Bog by Pinder in 1844, but I cannot trace it there at the present time, although there is every possibility that it still grows in the more inaccessible portions of this interesting bog. F. M. Webb added two further localities, near the village of Audlem, and also by Little Mere, Marbury, but it has disappeared from these localities. During the drought of 1921, Messrs. Williams and Leach discovered the remains of an *Osmunda* swamp on the shores of Baddiley Mere, about four miles south of Nantwich. This mere is used as a reservoir, and it was believed that the water level of the mere had approximated to the original level during the drought. Last summer I was shown the presence of the Royal Fern in an isolated fox covert, which, no doubt, accounted for its preservation. This covert corresponds to one of the remains of a peaty moss or even to one of the associations in the natural succession from the shallow lake which once covered inland Cheshire. There were about ten well-grown specimens and numerous young plants, while I was informed by the gamekeeper that young plants were to be found in the open 'rides' at some distance from the main society. The following species were found in close proximity: *Betula alba*, *Mercurialis perennis*, *Athyrium Filix fœmina*, *Ribes nigrum*, *Fraxinus excelsior*, *Lonicera Peri-clymenum*, *Osmunda regalis*. (See also de Tabley, 'Flora of Cheshire,' and Williams and Leach, 'A Relict *Osmunda* Swamp' *Lancs. and Ches. Nat.*, Vol. XIV.)—N. WOODHEAD.

## NOTES ON YORKSHIRE AMMONITES.

DR. L. F. SPATH.

### VIII.—MORE LOWER LIASSIC FORMS.

(Continued from p. 364, December, 1925).

ANYBODY who compares specimens of late *Promicroceras* (*nudum* group) and *Bifericeras*, on the one hand, and *Gagaticeras* on the other, must be struck by their close resemblance. *Gagaticeras* have often been mistaken for *Ammonites planicosta*, and there are yet several undescribed and apparently transitional species. Mr. W. E. F. Macmillan, F.G.S., recently collected two fragmentary examples in the 'oxynotus zone' (on Blake's map) of Mill Beck and south-east of Miller's Nab, Robin Hood's Bay, that both appear to be new. One of them resembles *Gagaticeras vesta* (Reynès), but has very sharp costation on the body-chamber, a morphic prefiguration of the later *Echioceras* and *Microceras*. The suture-lines at small diameters are sufficiently similar to support the assumption that there might be a 'lineage,' with successively more pronounced carination, beginning with a *Promicroceras*-like capricorn, and leading via *Gagaticeras* and *Parechioceras* to *Echioceratidæ*.

The writer may state at once that he would gladly welcome a flawless 'lineage' of this type. With the enormous number of ammonite forms now known, we have passed that happy stage—still enjoyed by workers in many other phyla—when we could cheerfully assume that 'as time went on' this or that happened to a stock, and lightly jump from the first 'Jurassic' forms to their descendants of 'Cretaceous' times. Even in the Trias our stratigraphical knowledge is as yet far too incomplete to accept as proved such apparently uninterrupted lineages as that from the Permian Sicanitids through the Eotriassic *Pseudosageceras* to *Sageceras* of the Meso- and Neotrias. In the Jurassic we know only a few true phyletic series, and these can be recognised only within the one genus *Phylloceras*. They show remarkably little progression from beginning to end, and merely in one character, namely, the evolution of the suture-line—and therefore perfect recapitulation—from the Bajocian up to the Tithonian. This represents an enormous time period compared with the vertical extent of those lineages, so dear to the academic evolutionist, that have from time to time been put forward merely to be recognised immediately as heterophyletic assemblages, or, at the best, successive offshoots of a common stock, but not true genetic series. If we merely review the different interpretations of the genera in our present 'lineage,' published by

different authors, it becomes clear that they can be no more than a morphological sequence. And when we find that the recapitulational hypothesis has not enabled workers to distinguish members of the two Lower Liassic families of Ammonitids and Deroceratids, supposed to be widely separated, we may well exclaim with Prof. Hawkins,<sup>1</sup> 'Alas for systematics!'

Mr. Buckman<sup>2</sup> suggested that if in *Gagaticeras* 'the carination be accidental or transient, and if carinate descendants be not produced,' then it should be reckoned, not as a primitive Echioceratid, but as a primitive Liparoceratid. In any case, *Gagaticeras* is close to Mr. Buckman's capricorn *Echioceras* ancestor and undoubtedly so similar to *Parechioceras*, definitely referred by this author to Echioceratidæ, that the lineage above mentioned may well pass muster with some workers, even if in view of the fact that young *Parechioceras* are subcarinate already at 7 mm. diameter, it would be necessary to assume successive waves tending towards carination, the first not succeeding beyond the *Parechioceras* stage. The depressed whorl-section and raricostation of later true *Echioceras* are also so neatly foreshadowed in at least some young *Gagaticeras* that with the additional evidence of the suture-line it seems natural to include both *Gagaticeras* and *Parechioceras* in the family Echioceratidæ.

In 1914, Mr. Buckman<sup>3</sup> suggested that in view of its nepionic stage with small, close-set, ribs, *Echioceras* might be derived from a densiparvulicostate capricorn like the costate (neanic) stage of *Bifericeras*. Since this genus (here grouped with Xipheroceratidæ) was also considered to be a primitive Liparoceratid, but with more complex suture-line than *Gagaticeras*, the difference of this view from the former may, perhaps, to some appear unimportant. *Bifericeras bifer* (Quenstedt), the genotype, itself, is rather distinct, and in its Xipheroceratid suture-line (compare e.g. figs. 9h, p. 303, and fig. 13<sub>1</sub>, p. 363) and bituberculation does not suggest affinity with Echioceratidæ. But Microceratids (*Cruciloboceras*, *Microceras* and *Hemimicroceras*) always seemed to the writer closely related to Echioceratids and, being Deroceratids, were thought to bring us, in any case, closer to the Lytoceratid parent stock.

It may be recalled in this connexion that Prof. Salfeld<sup>4</sup> considered, from the form of the internal lobe, that *B. bifer* was an offshoot of *Lytoceras*; whilst Frebold<sup>5</sup> stated that *Echioceras raricostatum* was a direct derivative of this Lyto-

<sup>1</sup> *Geol. Mag.*, 1923, p. 212.

<sup>2</sup> 'Yorkshire Type Ammonites,' Vol. II. (1913), p. vi.

<sup>3</sup> 'Yorkshire Type Ammonites,' Vol. II. (1914), p. ix.

<sup>4</sup> *Loc. cit.* (1923), p. 18.

<sup>5</sup> *Loc. cit.* (1923), p. 1.

ceratid *bifer* branch. The other characters, notably the ornamentation of Echioceratids, do not support this view, and on comparison of the entire suture-lines it will be seen that in *Bifericeras*, as in *Microceras* (figs. 136-9) and *Crucilobicerias* (fig. 2c-g, p. 139), as well as in *Deroceras* (figs. 1311-15) and its allies<sup>1</sup> it is of a type different from that of the Echioceratids and *Parechioceras*, except occasionally in the immature stages (figs. 133-5). Again, too much importance must not be attached to the fact that Mr. Buckman and Dr. Frebold, working on entirely different lines, should have come to similar conclusions, for whilst *Bifericeras* was still used in a wide sense by the former author in 1920,<sup>2</sup> the latter's capricorn *Lytoceras* offshoots, as has already been mentioned, are far too simple a solution of the extremely complex interrelations of these stocks.

It may here be added that in a later paper,<sup>3</sup> Frebold took '*varicostatus*' and '*subplanicosta*,' i.e., the families Echioceratidæ and Microceratidæ, to be endforms of their 'lineages,' and stated them to become extinct, whilst '*densinodus*' (i.e., *Crucilobicerias*), with its derivative '*natrix*' (i.e., *Platypleuroceras*), was supposed to have persisted uninterruptedly into the Lias  $\gamma$  or Pliensbachian.

Yet other views of the origin of Echioceratidæ have been put forward. In 1898 Mr. Buckman<sup>4</sup> derived *Echioceras* from some hypothetical ancestor that also gave rise to the family 'Arietidæ,' and in 1910<sup>5</sup> he still considered *Echioceras* to be a forerunner of Hildoceratidæ. It has already been mentioned that though Mr. Buckman now holds a view different from that published in 1898, on the Continent Echioceratids are still considered to be the direct descendants of *Arietites*, although Abel<sup>6</sup> figured an Echioceratid as '*Ægoceras vari-*

<sup>1</sup> The restricted family *Deroceratidæ*, Hyatt emend, is now taken to include *Deroceras* Hyatt, *Eoderoceras*, *Ophideroceras*, *Metaderoceras*, Spath, *Apoderoceras*, S. Buckman (including *A. dunrobinense*, nom. nov. = *Amm. cf. armatus nodogigas* Quenstedt, 1884, Pl. XXV., fig. 6), *Epideroceras* Spath, ***Hyperderoceras***, gen. nov. (created for *Amm. armatus ruga*, Quenstedt, *loc. cit.*, 1884, Pl. XXV., fig. 9) and ***Tetraspidoceras*** gen. nov. (for *Amm. quadrarmatus* Dumortier, *loc. cit.*, iii., 1869, p. 60, Pl. X., figs. 1-3). Forms of the latter have now been found by Dr. Lang in the *peregrinum* and *caprarius* (=lower *polymorphus*) zones of Dorset and they are connected by transitional forms with *Epideroceras* (*nodofissus* group), but have entirely different outer whorls. *Amm. planarmatus*, Quenstedt (*loc. cit.*, 1884, p. 211, Pl. XXVII., fig. 1) may be a simplified *Hyperderoceras*, as *Amm. spoliatus*, Quenstedt (*ib.*, Pl. XXVII., fig. 2), is probably a corresponding development of *Epideroceras*.

<sup>2</sup> *Quart. Journ. Geol. Soc.*, Vol. LXXVI., p. 77.

<sup>3</sup> 'Über Cyklische Meeres-Sedimentation,' Leipzig, 1925, p. 46.

<sup>4</sup> *Quart. Journ. Geol. Soc.*, Vol. LIV., table II., p. 451.

<sup>5</sup> 'Yorkshire Type Ammonites,' Vol. I., p. 196.

<sup>6</sup> Lehrbuch der Paläozoologie, Jena, 1920, p. 215, text-fig. 332 (after E. Fraas).

*costatum*.' The suture-line of *Epophioceras* aff. *landrioti* d'Orbigny sp. (fig. 124, p. 360)—a form referred by Fucini<sup>1</sup> to *Vermiceras*, which seemed to him identical with *Echioceras*—differs less from that of some Echioceratids than these differ among themselves. The suture-line of *Ægasteroceras* (compare fig. 6a, p. 266), another arietoid genus, is also very similar to that of certain Echioceratids.

Care must be taken, of course, not to connect up with the stocks here discussed a number of obviously heterochronous homœomorphs. The Polymorphid *Acanthopleuroceras arietiforme* (Opper) may be considered rather too distinct to be quoted in illustration; but as its name implies, and a glance at, e.g., Dumortier's figure<sup>2</sup> will show, the resemblance to some earlier Echioceratids and Arietids is remarkably close. The Domerian '*Arietoceras*' (*Seguenziceras*) might similarly be taken to demonstrate the persistence of Arietids to a still later date and in Alpine-Mediterranean deposits, where the different stocks occur (apparently) together, it is extremely difficult to separate the average (marmorised) examples of, say, *Echioceras* and *Seguenziceras*, just as, for example, Fucini confused his *Epophioceras* with the earlier *Vermiceras* and the later *Echioceras*. Yet it seems improbable that the comparatively simple, widely spaced, suture-lines of the flourishing family of Echioceratids, resembling those of so many undoubted arietoid stocks, are due to simplification of Deroceratid, complex, suture-lines. The later compressed and highly keeled Echioceratids, tending to smooth oxycones, may also be held to point to affinity of the stock with arietoids—in the widest sense—rather than with Deroceratids, and the writer cannot accept now that the Deroceratid origin of *Echioceras* is 'demonstrated,'<sup>3</sup> especially since the supposed 'transitional' forms are later in date and differ, as we have seen, in suture-line. On the other hand it must be conceded that if *Echioceras* started from *Promicroceras* or some unknown capricorn stock, with primitive suture-line, the development of the latter, correlated with the adoption of a carinati-sulcate ventral area (for reasons of mechanical adjustment), would tend to resemble the suture-line development in Arietids or Hildoceratids.

Some workers may put down *Echioceras* as clearly polyphyletic; others may feel tempted to consider that only one of the conflicting views of its origin can be right, and to plump for, say, inclusion in the super-family Ammonitida.

<sup>1</sup> *Pal. Italica*, Vol. VIII. (1902), pp. 132 and 152.

<sup>2</sup> *Loc. cit.* (III., 1869), Pl. XI., figs. 2, 3.

<sup>3</sup> Spath, 'Monograph of the Ammonoidea of the Gault' (Pal. Soc.), Pl. I., Vol. for 1921 (1923), p. 67.

But even this does not explain the position of *Gagaticeras*, and the real source of Echioceratids, in the writer's opinion, must be sought in another direction. The clue to it is supplied by those arietoids (*Paracaloceras*, *Canavarites*, etc.), the young of which have also been mistaken for true capricorns ('*Ægoceras*'). The writer even suggested in 1919<sup>1</sup> that *Promicroceras planicosta* might be connected with the arietoid genus *Euagassicerias*, in which there was a tendency to omit the keel and to continue costation across the venter. The latter suggestion is probably untenable; but the frequent convergence towards each other of the two great Lower Liassic families, Ammonitida and Deroceratida, shown also in the genera *Ægasteroceras* and *Slatterites*, discussed in part V. of the present series, seems highly significant. It is not surprising that ammonites are looked upon by many as far too homogeneous a group to be sub-divided into families, and that recent text books and catalogues revert to a mere listing, alphabetical or 'historical,' of genera.

(To be concluded.)

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**East Riding Lichen Records.**—During 1925 Mr. J. Grainger sent me some lichens collected by him chiefly in the neighbourhood of Holmpton, and a few at Spurn Point. From the specimens sent I have been able to determine the following species: *Evernia prunastri* Ach., *E. furfuracea* Mann., \**Peltigera canina* Hoffm., *Parmelia saxatilis* Ach., *Xanthoria parietina* Th. Fr., and var. *aureola* Th. Fr., *Physcia cæsia* Nyl., *Lecanora calcarea* Sommerf., *L. conizæa* Nyl., *Pertusaria faginea* Leight., \**Cladonia pyxidata* Fr., \**C. gracilis* Willd., \**Cladina sylvatica* Nyl., \**C. uncialis* Nyl. (The asterisk denotes specimens collected at Spurn Point).—W. E. L. WATTAM.

**Rock Leech, or Skate Leech (*Pontobdella muricata*), at Scarborough.**—A full-grown example of this fine marine leech was found at Scarborough on November 11th, 1925, clinging to the back of a Common Skate (*Raia batis*) which had been landed upon the fish market by a local trawler. This parasite is usually found upon various species of skate, and does not appear to attack other fish as a rule, although a single specimen has been recorded from *Torpedo marmorata*. It is found in the Mediterranean and on the western and northern coasts of Europe, and is said to be not uncommon in the North Sea. This is, however, the first time I have found it after searching for it for many years. The specimen measures 6 inches in length, and is being placed in the Scarborough Museum.—W. J. CLARKE.

<sup>1</sup> Spath, *Geol. Mag.*, p. 175.

YORKSHIRE DIPTERA (CAMPODEIDÆ).

RICHARD S. BAGNALL, F.R.S.E., F.L.S.

IT would seem that of the dozen species of *Campodea* now known as British, eight are widely distributed, and may be expected to occur in any district from the southern part of Scotland southwards, while three, *Campodea grassii* Silv. (Grange-over-Sands, but of Lusitanian origin), *C. devoniensis* Bagn. (south coast) and *C. westwoodi* Bagn. (New Forest) are essentially southern species. Further species of this southern section will almost certainly be found, while it is possible that boreal and sub-alpine species remain to be discovered in the north and mountainous parts of Scotland, and northern Europe.

I am able to give the following records of eight Yorkshire species which, however, do not give any idea of their real distribution in the county, as all of them are certainly to be found throughout the area, with the possible exceptions of *C. silvestrii* Bagn. and *C. wallacei* Bagn.

*Campodea staphylinus* Westw. Common and generally distributed: Lonsdale, 1000 ft., v./18 (J. W. H. Harrison); Bardsey, near Leeds, v./19; Kirk Deighton, near Wetherby, v./19; Leeming Bar, 2/iv./21; Barmby Moor, iv./20, iv./21; Redford, Notts., iv./20.

*Campodea silvestrii* Bagn. Rare near coast, Speeton, vii./24.

*Campodea gardneri* Bagn. A small but common species often accompanying *C. staphylinus*: Lonsdale, 1000 ft., v./18 (J. W. H. Harrison); Bardsey and Allwoodley, near Leeds, v./19; Leeming Bar, 2/iv./21; Barmby Moor, coast near Speeton, vii./24.

*Campodea wallacei* Bagn. Rare but widely distributed, affecting beech woods. Bardsey, near Leeds, v./19; Leeming Bar, 2/iv./21.

*Campodea lubbocki* Silv. In a Leeds garden, v./19.

*Campodea meinerti* Bagn. Bardsey, near Leeds, v./19.

*Campodea lankesteri* Silv. Our largest species which (with the two preceding species) affects rich soils. In a Leeds garden, v./19.

*Campodea fragilis* Mein. Local, Barmby Moor, Bardsey, near Leeds, several, v./19; coast north of Whitby, 23/ii./21; Leeming Bar, 2/iv./21.

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**Galathea strigosa on the Yorkshire Coast.**—In connection with the record of the occurrence of this species at Withernsea, it may be noted that it is not at all uncommon off Scarborough, where it is frequently taken in the fishermen's crabpots, being also sometimes cast upon the shore after a rough sea. Small examples may occasionally, but not commonly, be found in the rock-pools at extreme low tide, but the species usually found in this situation is *G. squamifera*. The young examples are much more brightly coloured than the adults.—W. J. CLARKE.

## YEOVILIAN AMMONITES IN THE INLAND AREA OF THE YORKSHIRE MOORS.

W. E. F. MACMILLAN.

DURING my holiday in 1925, though I spent less time than usual at Danby, I was able to devote a few days to examining further the exposures referred to in *The Naturalist* for August, 1925, and also a fresh exposure in Danby Head. I have now shown to Dr. Spath all the specimens I obtained, and the results up to date, in their bearing on the stratigraphy, can be summarised as follows. The specimens referred to were all found in place, unless the contrary is stated.

### GREAT FRYUP HEAD.

In Yew Grain, the following succession of beds was noted, reckoning from the top :—

	<i>feet</i>
(a) Coarse yellow sandstone, current-bedded ...	6—8
(b) Fine grey ferruginous sandstone, flaggy ...	8
(c) Do. do. massive, containing <i>Phlyseogrammoceras</i> 2 feet from the top ... ..	8
(d) Hard flaggy ferruginous sandy shale, with <i>Grammoceras</i> 3 to 4 feet from the base	10
(e) Grey shale of the alum type.	

A massive band similar to (c), which crosses the Iron Spa Dike 150 yards away, yielded *Hudlestonia*. I had only time for a cursory examination of (b). It appeared to be the same type of rock as (c), but less massive.

This gives a thickness of 10 feet for the *striatum* beds here, and at least 8 feet (possibly up to 16 feet) for the *dispansum* beds. The four beds (a) (b) (c) (d), having a total thickness of about 34 feet, I take to be equivalent (my measurements being rough and ready) to Fox-Strangways' '32 feet of ferruginous sandstone, shaly and fossiliferous at the base,' given (*Jurassic-Rocks*, Vol. I., p. 169) as an exposure of the Dogger.

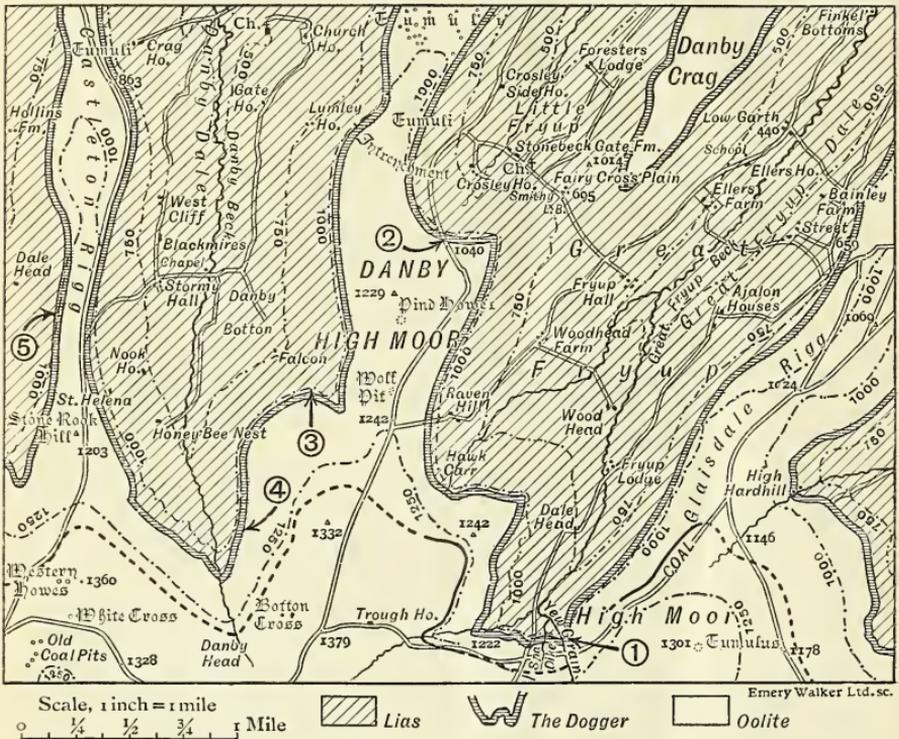
### LITTLE FRYUP HEAD.

In the quarry here I found *Phlyseogrammoceras* at two levels, 5 feet and 12 feet above the floor. The whole 12 feet of the quarry face consists of a massive fine-grained grey micaceous sandstone, sometimes ferruginous, capped immediately by the humus of the moor. The whole would appear to belong to the *dispansum* zone, a massive facies being apparently characteristic both here and at Great Fryup (and, for that matter, at the Peak). I was only able to make one visit to Little Fryup, and had no time to look round in

the vicinity of the quarry for exposures of the beds immediately below, which require to be examined in order to ascertain whether the *striatum* zone also is represented here.

#### DANBY DALE.

In the exposure on Falcon Side, which I examined last year, I found specimens of *Grammoceras* washed down the shale gullies, but failed to find any in place. I think there is little doubt, however, that they were derived from the grey sandy micaceous shale, or mudstone, which forms the



top of the Upper Lias shales, as I found the same fossil in place in a similar bed at another exposure three-quarters of a mile away in Danby Head. This latter is a 50 foot slope of shale, the top part, for 20 or 25 feet, being of the silvery-grey sandy micaceous type, the bottom part dark blue alum shale. Ten feet below the junction with the overlying sandstones, apparently Estuarine, I found a nest of *Grammoceras* packed closely together and in good preservation, a piece of field evidence tending to confirm the opinion expressed by Dr. Spath, and by other palaeontologists, who saw my specimens at the Annual Conversazione of the Geologists' Association, that these are not derived fossils.

I have not so far found any trace in Danbydale of ammon-

ites belonging to the *dispansum* zone, or of the massive type of rock in which they occur in the Fryups.

The lie of the ground and the distances between the exposures described are indicated in the accompanying map, in which the exposures are numbered in the order in which they are dealt with above. No. 5 is an exposure on the line of the Dogger on Castleton Ridge, at which I found an ammonite of the *Murchisonæ* group (Aalenian).

The area in question lies approximately 20 miles west of the Peak Fault, and the occurrence of these Yeovilian beds here suggests that it would be worth while for geologists, who have the opportunity, to examine, from this point of view, other scars in which the junction of the Lias and the Oolites is exposed over a wide area in the Yorkshire Moors and Cleveland Hills.

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**Little Owl at Sherburn-in-Elmet.**—My friend, Mr. J. E. A. Titley, has sent me a Little Owl for identification, which his keeper shot at Sherburn-in-Elmet. The keeper was stood upon the railway bridge, when he saw a strange bird, carrying something, flying up the railway track towards him, he shot it and found it was bearing the half-eaten body of a Lapwing.—R. FORTUNE.

**Ledum latifolium on Blackstone Edge.**—In *The Journal of Botany* (Vol. LXIII., p. 178) I recorded the occurrence of a species of *Ledum*, as perhaps *palustris*, which was found in 1917 on Soyland Moor, Blackstone Edge, at an elevation of 1600 ft. O.D. This plant flowered in 1918, and was photographed by Mr. F. Taylor, of Oldham. The species has now been identified by Mr. A. J. Wilmott, of the Botanical Department, South Kensington Museum, as the North American *L. latifolium* and not *palustre*. Though the foliage of the two is very similar, the number of the stamens is five in the former and ten in the latter species.—FREDK. J. STUBBS.

**Exotic Moth in Oldham.**—On the 24th October, 1925, a boy caught a moth which was flying about on the Oldham Market Ground and brought it alive to me a few minutes later. Not recognising it as any European species, I sent it to Mr. W. H. T. Tams, of the South Kensington Museum, who identified the insect as *Othreis materna*, a native of the Tropical parts of Africa and Indo-Australia. About three and a half inches across the wings, this moth reminds me of a big Yellow Underwing with a black spot in the middle of each hind wing. When it reached me, the captive was fluttering vigorously, but the wings were badly rubbed and torn. Probably this moth is an alien escaped from one of the neighbouring shops handling foreign produce.—FREDK. J. STUBBS, Oldham Corporation Museum.

**THE YORKSHIRE NATURALISTS' UNION'S  
SIXTY-FOURTH ANNUAL REPORT  
FOR 1925.**

(Continued from page 18).

**ENTOMOLOGICAL SECTION.**

**Diptera** (C. A. Cheetham):—The pages of *The Naturalist* have evinced the growth of interest in this group of insects. The Presidential Address of Mr. Percy H. Grimshaw stimulated workers to further efforts, bringing the subject before others, and Mr. Geo. Grace's paper on methods of studying the smaller Diptera added several workers to the study.

The great increase of mosquitoes, which, according to the daily press, has been noted in this country, has not been seen by your Secretary, although two species are added to our list, but only about eight specimens of these were obtained in as many hours. Other species have been less frequent than in some former years. A possible explanation of this supposed increase may be due to the modern fashions of short dresses and thin stockings exposing a much greater area to easy attack. The deaths attributed to mosquito bites seem often based on very slender evidence, it being doubtful how many of the sufferers saw the insect, or could identify a mosquito if they did see it.

Bibios were few or flying when not observed; *Bibio pomonæ* F. was seen several times in Crag Wood, Rawdon, a new station for it. The troublesome leather jacket, daddy long legs, *Tipula oleracea* L., occurred in vast numbers in August, and in late October *T. pagana* Mg. seemed more plentiful than usual, but none of the other species of the genus was noticeable in this respect. *Peplomyza litura* Mg. is another species that appeared to be far more plentiful at Rawdon this year than it has been previously. The hot weather also made the Clegs seem abundant, the beautiful *Chrysops cæcutiens* L. being frequent at Austwick Moss, and *C. relicta* Mg. being caught at Barnsley by Mr. E. G. Bayford. *Helius dubius* Edw. occurred in quantity in Meanwood Valley in June.

At Allerthorpe Common *Lasiopogon cinctus* F., *Dioctria baumhaueri* Mg., *Thereva annulata* F., *Conops flavipes* L., *Chrysotoxum bicinctum* L., and *Tipula fascipennis* Mg. were caught; at Austwick *Idioptera fasciata* L., *Oxycera trilineata* F., *Atherix ibis* F., *Acrocera globulus* Pz., *Chelipoda melanocephala* F.; in Rawdon Crag Wood *Eristalis sepulchralis* L., *Pachyrrhina analis* Schum., *P. lunulicornis* Schum., and *Platypeza modesta* Ztt.

All these have been previously recorded, but mostly as single occurrences.

Among the new records the most interesting are *Anopheles plumbeus* Stph., *Finlaya geniculata* Ol., *Chironomus tarsalis* Wlk., *Hypophyllus discipes* Ahr., *Tephritis absinthii* F., and *Platypeza consobrina* Ztt. from Rawdon Crag Wood; *Tabanus cordiger* W. from Nidd; *Pseudocænusia longicauda* Ztt. from Austwick; *Euthyneura gyllenhalii* Ztt. from Pateley and Coxley; *Psilopus contristans* W., *Chrysotoxum cautum* Harr., and *Zodium cinereum* F. from Allerthorpe; and *Loxocera sylvatica* Mg. from Force Ghyll, Whernside. A recent note in *The Entomologist's Monthly Magazine* by Mr. F. W. Edwards gives a list of Diptera which he has bred from a portion of an old log sent to him by Mr. Bayford from Barnsley, they are mostly additions to our lists.

The result of the season's collecting will add between thirty and forty to the number of species known to occur in Yorkshire.

**Chironomidæ** (G. Grace):—The work of examining the Yorkshire Chironomids has gone on steadily all the year. As a result of the Bradford meeting Mr. R. Butterfield and Mr. J. Wood have made a collection of over 2000 flies within two miles of Keighley station, and arranged them in genera pending a closer examination, as time permits.

Mr. Hincks, at Leeds, has commenced a detailed study of the genus *Chironomus*, and has already over twenty species recorded, and Mr. Dibb is working on the Tanypinines. At Ilkley I have given most of the year to the Orthocladiaæ, and have determined :—

Metriocnemus ...	12 species	Trichocladus ...	6 species
Orthocladus ...	19 ,,	Cricotopus ...	10 ,,

At present these have not all been co-related with the British Museum specimens, but it is already known that quite numbers of them are new.

New workers are required to take up the collection of the larval and pupal stages, and to study the life histories. If any members would care to help in this part of the work, we should be pleased if they would get into touch with me at Ilkley.

**Neuroptera and Trichoptera** (G. T. Porritt) :—Owing to indifferent health I was able to do but little outdoor entomological work myself, and very few records have been forwarded to me. Mr. C. A. Cheetham reports the dragonflies *Sympetrum scoticum* and *Pyrrhosoma nymphula* as less common than usual at Austwick, but that *Æschna juncea* was perhaps in its normal numbers. *Libellula quadrimaculata*, *Æschna cyanea*, and *Cordulegaster annulatus*, which usually occur there, he did not see at all. The Rev. C. D. Ash sent me the lacewing fly, *Chrysopa ventralis*, from Everingham ; and Mr. E. G. Bayford specimens of the Trichopteron *Limnophilus vittatus*, taken at Ryhill, near Wakefield, on September 24th. It is an abundant species in most places, but is interesting in this case on account of the late date. Mr. W. J. Fordham took a number of species at the Union's excursion to Middleton-in-Teesdale, and has already recorded them in *The Naturalist*.

**Lepidoptera** (B. Morley) :—The season has been much better than any since 1921. Larvæ, generally, have been abundant. Butterflies, however, have not been much in evidence, with the exception of the three common, whites, which had all a very numerous second brood, especially *P. brassicæ*, the numbers of which were exceptional. Little has been seen of other species in the West Riding.

Of the *Vanessids*, two examples of *V. atalanta* seen in the garden at Wind Mill are the only ones noticed that I can ascertain. *Lycana icarus* was not uncommon in a few stations, and a partial second brood appeared in early September.

With the moths, while many species have been common, others have been missing, a notable example being *Plusia gamma*. I have not seen one during the season, but at Middlesbrough a few have been noticed. *P. pulchrina* was abundant during late June, and *P. iota* was common, while only one *P. chrysitis* was taken, the latter usually being by far the commonest of the three.

A few examples of *Thyatira batis* were taken in Deffer Wood in June ; it has not been taken there for many years. In the same wood and at the same time *Hepialus velleda* was in great abundance, but the form *gallicus* seemed to be scarce, only one being obtained after netting a considerable number. Larvæ of *Boarmia repandata* were obtained from the same wood in April. Every one of the resulting moths was almost uniformly very dark grey in colour. The species with us is almost entirely melanic, but it would be premature to conclude that it is completely so. Last year I and others thought that *Miselia oxyacantha* had all become of the form *capucina*, but this year the species has been very common, and quite half have been of the type form.

Black larvæ of *Bombyx* var. *callunæ* from Penistone Moors produced males slightly darker than ordinary, and females of a dark smoky brown without a trace of the ordinary yellow colour.

*Thera variata* of a black form turned up in Deffer Wood for the first time in June, the pines then were swarming with an extraordinary large number of *Bupalus piniaria*.

The melanic form of *Odontopera bidentata* has occurred at Skelmanthorpe for the first time.

Three species have been added to the district list: *Hedya lariciana*, Deffer Wood, June 20th, 1925; *Sciaphila hybridana*, Cawthorne, July 4th, 1925; *Orthotænia antiquana*, Cawthorne, July 4th, 1925. Regarding the last species, its occurrence reaffirms an old record for the south-west of the county. Mr. T. Ashton Lofthouse also took the species at Redcar on July 3rd, 1905. Mr. Lofthouse has also bred a specimen of *Ephestia ficulella* in August from figs obtained from the local grocer. This does not appear to be recorded in Porritt's list. Also in his garden at Middlesbrough *Scoparia angustea* occurred.

A specimen of *Acherontia atropos* was found at Huddersfield on September 14th, 1925.

Mr. G. T. Porritt writes that the feature of the season in the Huddersfield district has been the extraordinary abundance of *Orgyia antiqua*. On July 15th, on Royd Edge Moors, Meltham, large areas of the bilberry plants were practically stripped of leaves by the larvæ, many of which were then quite small. He visited the moor again on August 15th, and found the denudation of the plants complete, the larvæ had eaten every vestige of the leaves, and only the bare stalks were left. On the walls bordering the moor, the larvæ were dead and dying in hundreds, starved to death. The earlier moths were flying about in numbers, and the specimens for the most part were much darker than the southern form, of a deep chocolate colour, a good percentage of them being of the variety *confinis* Grvh.

Later, larvæ of *Hadena pisi* were more abundant on bilberry than he had ever before seen them in the Huddersfield district, also on Royd Edge Moor he found *Amphisa gerningana* for the first time.

In September, 1924, a specimen of *Vanessa antiopa* was taken in Longley Road, Huddersfield, and taken to the Ravensknowle Museum.

Specimens of *A. atropos* have also been obtained at Barnsley early in June, at Marley, near Keighley, on October 6th; and *Sphinx convolvuli* also at Keighley on August 22nd, recorded by Mr. Rosse Butterfield.

Mr. Chris. A. Cheetham reports a specimen of *Zeuzera pyrina* from Farnley, Leeds, and Mr. T. H. Fisher also obtained a pair of this species at Clayton West in August. Mr. Fisher also obtained a black specimen of *Acronycta menyanthidis* on a heath near Penistone in early June.

**Coleoptera** (M. L. Thompson):—Members of the Coleoptera Committee attended the excursions of the Union at Egton Bridge, Middleton-in-Teesdale, Askham Bog, Malham, and Coxley Valley. At the first of these the most interesting insect met with was *Micrurula melanocephala* Marsh. The weather conditions were very adverse at Middleton-in-Teesdale, and the only species of interest obtained were *Hister 12-striatus* Schr. and *Orchestes foliorum* Müll. On a visit to this locality paid by me in July *Quedius fulvicollis* Steph. was taken in sphagnum on Cronkley Fell—a species new to the county. There was quite a good attendance at Askham Bog, but the time at our disposal was all too short. One species, however, *Gallerucella lineola* F., was added to the Yorkshire list, and two others, *Philonthus micans* Grav. and *Anisosticta 19-punctata* L., to the vice-county. The re-occurrence in the Cleveland District, at Glaisdale, of *Choleva longula* Kell. may be mentioned, and of *Tetropium gabrieli* Wiese. var. *crawshayi* Shp. at Middlesbrough, whither the insect had doubtless been imported with timber. Another interesting capture in this district is that of *Platycis minuta* F. Mr. J. M. Brown took a specimen of this local beetle in Mulgrave Woods, thus supplementing an old Scarborough record made by Lawson many years ago. It is interesting to note, also, that Mr. W. D. Hincks has met with the local *Carpophilus sexpustulatus* F. in the vicinity of Leeds, while in the same district Mr. J. R. Dibb took single specimens of



## STATEMENT OF INCOME AND EXPENDITURE.

### 12 months to November 23, 1925.

INCOME.				EXPENDITURE.	
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
Members' Annual				Expenses of Meetings ... ..	11 15 0
Subscriptions, arrears	12 15 6			Postages, etc. (including addressing,	
" 1925	107 19 0			etc., of circulars), (Hon. Secs'. A/c)	11 19 1
" 1926	5 9 0			Printing and Stationery (General A/c)	38 7 6
	-----	126 3 6		" (Hon. Treasurer's A/c)	0 19 3
Levies from Associated				Postages, etc. " "	1 8 4
Societies, arrears	2 2 10				
" 1925	14 9 7				
	-----	16 12 5			
Life Members' Subscriptions ( <i>contra</i> )...		10 16 0		' NATURALIST ' :—	
Sales of Publications		6 0 4		Members' Copies ...	179 2 0
Bank Interest ... ..		2 8 6		Exchanges ... ..	5 12 6
' Booth ' Fund for printing ... ..		3 10 0		Binding ... ..	1 4 6
Expenses of Meetings, Postages, etc.,				Editor's Postages, etc. ...	7 18 10
defrayed by anonymous donors ...	14 4 7			Extra Illustrations ...	3 18 6
	-----	£ s. d.			197 16 4
				Balance, being Excess of Income over	
' NATURALIST ' :—				Expenditure ... ..	66 3 4
Subscriptions, arrears	14 9 0				
" 1925	134 14 6				
" 1926	6 16 0				
' Cheesman ' Fund for					
illustrations ... ..	5 0 0				
	-----	160 19 6			
Actual Income for					
year 1925 -	£284 2 11				
" Expenditure					
for year 1925	263 15 6				
		-----			
		£340 14 10			
		-----			
		£340 14 10			

E. HAWKESWORTH,  
*Hon. Treasurer.*

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### FUNGUS FORAYS.

In days of yore folk went to church to hear of sins and woes ;  
 Some went because they music liked—and some to have a doze.  
 Now, when we hunt for funguses, our eyes are open wide ;  
 But when we meet for evening ' talk ' it cannot be denied  
 The Lecturer who's wide awake has often seen us nod—  
 In fact, at peace with all the world—with Nature and with God !  
 And though he talk of ' Alfred Clarke,' or ' Cortinarius,'  
 He may perceive quite clear enough 'tis just the same to us.  
 Poor Lecturer, when on his feet, he cannot take a spell—  
 Or he might join the company and have a nap as well !  
 When at the close the Chairman wakes and blinks with both his eyes  
 A general rousing-up ensues, and some one has to rise  
 To praise with hearty vote of thanks a paper interesting,  
 Delivered while the audience slept, their weary bodies resting !  
 Mycologists ! if you should think this story overdone  
 Remember it's but written just to cause a bit of fun.—A.E.P.

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We learn from the press that while a Cleethorpes fisherman was crossing the sands he saw a live seal on the beach. The animal snarled and snapped. Not being disposed to allow the seal to return to the water to prey upon fish, he attempted to rope it, but time after time the seal slipped out of the noose. It led him a merry chase over the sands before eventually he secured it with a rope about the neck, and so took it home dog-like on a lead.

## PLANT GALLS FROM THE ABERYSTWYTH DISTRICT.

W. FALCONER, F.E.S.

At the end of July last the writer passed a fortnight in the above-named district, but, being on a general holiday, collecting was only a secondary consideration and intermittent in character in scattered localities in the neighbourhood of the town. In these circumstances it is scarcely likely that the distribution and number of the plant galls observed could be correctly ascertained, so that on these matters nothing is said except in those cases the abundance of which was obvious.

The most interesting of the 99 forms obtained were *Contrarinia campanulæ* Kieff., *C. linariæ* Kieff., *Janetiella thymi* Kieff., *Oligotrophus hartigi* Lieb., *Perrisia malphigii* Kieff., *P. tiliamvolvæns* Rüb. and *Eriophyes?* spec., on elm (both forms), while for *Eriophyes?* spec. Houard 1135 there seems to be no previous British record. Two leaf fungi also, *Taphrina cærulescens* Tul. (oak) and *Polystigma rubrum* Pers. (blackthorn), have not hitherto received recognition as gall agents.

The following, which are usually generally diffused in most districts of the country, are not localised:—

- HYM. *Pontania proxima* Lep. On *Salix aurita*, *fragilis* and *cinerea*.  
*P. pedunculi* Htg.—On *S. caprea*, *cinerea* and *aurita*. *Neuroterus baccarum* Linn. and f. *lenticularis* Oliv., *Andricus ostreus* Gir., and *Cynips kollari* Htg., on oaks.
- DIP. *Perrisia cratægi* Winn., on hawthorn. *P. ulmarie* Brmi., on meadow sweet. *P. urticæ* Perr., on nettles. *P. plicatrix* H. Löw, on brambles.
- HOM. *Psylloopsis fraxini* Linn., on ash.
- Ac. *Eriophyes nalepai* Fekn., and *E. lævis* Nal., on alder.

### HYMENOPTERA.

*Cryptocampus venustus* Zadd. On *Salix aurita*, Devil's Bridge and Llyfnant Valley.

The next 11 forms on oak.

*Andricus albopunctatus* Sch. Between Glaspwl and the Cascade, Llyfnant Valley.

*A. curvator* Htg. On the leaves, Cwm Woods and Aberayron.

*A. disticha* Htg. Ispitys Cynfyn and Lake Talyllyn.

*A. glandulæ* Schrnk. By the side of Lake Talyllyn.

*A. pilosus* Adler f. *secundator* Cam. Cwm Woods and Llyfnant Valley, many new and old.

*A. solitarius* Fonsc. Llyfnant Valley and Cwm Woods.

*A. testaceipes* Htg. var. *nodifex* Kieff. Several examples at the same two places.

*Dryophanta verrucosa* Sch. f. *divisa* Htg. Devil's Bridge, Parson's Bridge, Llanilar and Llyfnant Valley.

*Neuroterus albipes* Schrnk.—Llanilar.

*N. vesicator* Schl. Cwm Woods, Llanilar, Llyfnant Valley and Lake Talyllyn, in plenty.

*N. vesicator* Schl. f. *numismatis* Oliv. Llanilar and Llyfnant Valley.

- Rhodites spinosissimæ* Gir. On *R. spinosissima* L. One plant affected near the exit from Cwm Woods to the golf course.  
*R. rosæ* Linn.—On wild rose, Pen Dinas.  
*Aulax hypochæridis* Kieff. On *Hypochæris radicata* L., Constitution Hill, overlooking the town.

## DIPTERA.

- Anthomyia signata* Brschk. On male fern, Llyfnant Valley. The ends of the pinnae of bracken were similarly rolled, and although the agents had gone, the deformation was probably due to the same insect. Constitution Hill, Cwm Woods, near Clarach, Wallog, Llanilar, but most plentiful in the Llyfnant Valley.  
*Contarinia betulicola* Kieff. On birch, near Ispitys Cynfyn.  
*C. campanulæ* Kieff. On hairbell, roadside, near Clarach Bay.  
*C. linariæ* Winn. On *Linaria vulgaris*, banks of the River Ystwyth, Aberystwyth; several examples.  
*C. ruderalis* Kieff. On hedge mustard, Aberayron.  
*C. steini* Karsch. On red campion, Cwm Woods.  
*C. tiliarum* Kieff. On *Tilia europæa* L., Llanilar.  
*Hartigiola annulipes* Htg. On beech, Cwm Woods.  
*Janetiella thymi* Kieff. On wild thyme, Pen Dinas.  
*Iteomyia capræa* Winn. On *Salix cinerea*, Cwm Woods and Llyfnant Valley. On *S. aurita*, same localities and Lake Talyllyn. On *S. capræa*, Cwm Woods.  
*I. capræa* var. *major* Kieff. On *S. cinerea*, near Borth and Constitution Hill, Llyfnant Valley.  
*Macrodiplosis dryobia* F. Löw. On oak, Cwm Woods, Llanilar and Lake Talyllyn.  
*Macrolabis corrugans* F. Löw. On hogweed, Clarach Bay and Llangorwen Churchyard.  
*Oligotrophus bursarius* Brmi. On ground ivy, Cwm Woods.  
*O. hartigi* Lieb. On *Tilia europæa*, Llanilar.  
*O. ulmi* Kieff. On wych elm, Aberayron.  
*Perrisia engstfeldii* Rübs. On meadow sweet, Llanilar and Llyfnant Valley.  
*P. filicina* Kieff. On bracken, Cwm Woods and Llyfnant Valley.  
*P. fraxinea* Kieff. On ash, Cwm Woods, Clarach, Pen Dinas, Llanilar, Lake Talyllyn.  
*P. fraxini* Kieff. On ash, Cwm Woods, Wallog, Lake Talyllyn and Aberayron.  
*P. hygrophila* Mik. On *Galium palustre*, Llyfnant Valley.  
*P. malphigii* Kieff. On oak, Llanilar and Llyfnant Valley.  
*P. praticola* Kieff. On ragged robin, Llyfnant Valley.  
*P. pustulans* Rübs. On meadow sweet, Ponterwyd.  
*P. rosarum* Hdy. On wild rose, Clarach, Pen Dinas and Llyfnant Valley.  
*P. tiliamvolvans* Rübs. On *Tilia europæa*, in a hedge row at Llanilar; many examples.  
*P. tortrix* F. Löw, or *P. sodalis* F. Löw. On *Prunus* sp., Clarach, Wallog and Constitution Hill. To determine the species the fly must be bred out.  
*P. veronicæ* Vallot. On germander speedwell, Clarach, Wallog, Borth, Llanilar, Llyfnant Valley, Cwm Woods.  
*Rhabdophaga terminalis* H. Löw. On *Salix fragilis*, Lake Talyllyn (numerous), Llanilar.  
*R. rosaria* H. Löw. On *S. aurita*, Cwm Woods and Llyfnant Valley.  
*Rhopalomyia millefolii* H. Löw. On yarrow, top of Nanny Goat Lane (Pen Dinas).  
*Stictodiplosis hypochæridis* Rübs. On long-rooted catsear, Constitution Hill (several places) and Wallog.

*Stictodiplosis jacobææ* H. Löw. On *Senecio jacobææ*, Llanbadarn Road ; on *S. aquaticus*, near Borth ; on both plants, Aberayron.

## HOMOPTERA.

*Aphis cratægi* Bcktn. On hawthorn, near Glaspwl, Llyfnant Valley.

*A. rumicis* L. On broad-leaved dock, Llanbadarn and Borth.

*A. sorbi* Kalt. On mountain ash, Lake Talyllyn.

*Psylla buxi* Linn. On garden box, Glaspwl and Llangorwen Churchyard.

*Schizoneura ulmi* L. On elms, Aberdovey, Glandyfi, Cwm Woods, Llangorwen.

*Siphocoryne xylostei* Schrnk. On common honeysuckle, Llanilar, bushes between the station and the Church, and roadside along the 'glen.'

*Trioxa remota* Förster. On oak, Llanilar (not uncommon).

## ACARI.

*Epitrimerus trilobus* Nal. On the elder, Cwm Woods.

*Eriophyes avellanæ* Nal. On hazel, Llyfnant Valley and Lake Talyllyn.

*E. brevitarsus* Fckn. On alder, Aberayron and Llyfnant Valley.

*Eriophyes* sp. On the alder, Houard 1135, Aberayron.

*E. galii* Karp. On goosegrass, Aberayron.

*E. galiobius* Can. On *Galium verum*, banks beyond the ferry, Aberystwyth, and Aberdovey sandhills.

*E. goniothorax* Nal. On hawthorn, Aberayron, near Clarach, Llanilar, Llyfnant Valley.

*E. pyri* Pgnst. On mountain ash, Cwm Woods and Devil's Bridge.

*E. quercinus* Can. On oak, Cwm Woods and Llyfnant Valley.

*E. salicis* Nal. On *Salix aurita*. As the last.

*E. similis* Nal. On blackthorn ; several spots, about Constitution Hill and off the Clarach Road ; cliff walk to Borth ; Llanilar.

*E. thomasi* Nal. On wild thyme, Clarach Bay and Pen Dinas.

*E. tilieæ* Pgnst. var. *liosoma* Nal. On *Tilia europæa*, Llanilar.

*Eriophyes* sp. On elm, both forms, Houard 2044 and 2045, Aberayron and Llanilar.

*E. macrorrhyncus* Nal.

*Phyllocoptes acericola* Nal.

*P. gymnaspis* Nal.

*P. epiphyllus* Nal. On ash, Houard 4646, widespread.

} On sycamore, Cwm Woods.

## FUNGI.

*Exoascus alnitorquus* Qinter. On alder, Aberayron and several places at Llanilar and Llyfnant Valley.

*Taphrina aurea* Sdbk. On black poplar, Aberayron, abundant ; Llanbadarn Road.

*T. cærulescens* Tul. On oak, Llanilar. Large, irregular blisters on leaves, convex above and concave below.

*Polystigma rubrum* Pers. On blackthorn, Cwm Woods (Clarach Bay). Slight hypertrophy of leaf above and below at part affected, and brilliant discoloration.

I am indebted to Mr. F. A. Mason for the identification of these two fungi.

—: o :—

Dr. Alexander Meek edits *The Report of the Dove Marine Laboratory*, Cullercoats, New Series XIV. (58 pp., 5/-). After the general report there are papers on 'Herring Shoals,' by B. Storrow ; 'Size of Herrings,' by Dorothy Cowan ; 'Pollution of the River Tyne,' by E. M. Meek ; 'Plankton Investigations,' by A. Meek ; and 'Faunistic Notes,' by B. Storrow. The tables and statistics given in the report will prove very useful to investigators.

## S.-WEST YORKSHIRE ENTOMOLOGICAL SOCIETY.

By the invitation of Mr. W. Barraclough, the members of the South-West Yorkshire Entomological Society held a meeting at his residence, Low Moor, Bradford, on November 21st, 1925. The following exhibits were passed around for inspection :

Mr. G. T. Porritt : *Euchloe cardamines* var. *ochrea* ♀♀ with yellow underwings, from Tyrone ; dark forms of *Odonestis potatoia* ♀♀, from Sussex ; Melanic *Acronycta aceris*, from Stoke Newington ; and a new form of *Abraxas grossulariata* bred from his own garden at Huddersfield.

Mr. Barraclough : a case of *Melitæa aurinia* from various English, Scottish, Welsh and Irish localities, showing much racial variation.

Mr. B. Morley : *Papilio podalirius* and vars. *feisthamelii* and *zanclæus*, *Pontia daphidice*, *Euchlœe belia*, *E. belemia*, *E. euphonoides*, *Zegris eupheme*, *Gonepteryx cleopatra*, *Argynnis pandora*, *Melanargia galatea*, *M. lachesis*, *M. syllius*, *M. ines*, *Plusia chalcites*, *Euprepia pudica*, *Zygæna baltica*, *Z. lavandula*, *Z. sarpedon* and *Z. occitanica* and its variety *discincta*, all from the south of Spain, except the *M. galatea*, which are of British origin.

During the afternoon an address on ' The Pollination of the Primrose ' was given by Mr. A. Malins Smith, M.A., of Bradford Technical College. The phenomenon of heterostylism in the common primrose and other British Primulas was described, and it was pointed out how the two forms of the primrose differed, not only in the length of the style, but also in such minute details as the size of the pollen grains and of the stigmata papillæ.

Darwin's explanation of heterostylism was given, and was stated to be that the unions called by Darwin ' legitimate ' are more likely to occur because of heterostylism, and that these unions are more productive of fertile seed. Since Darwin's theory of heterostylism was brought forward, many observers have been led to make records of insect visitors to the primrose. These observations were reviewed, and practically all observers were agreed upon one striking fact, viz., the fewness of insect visitors to our British Primulas, and the consequent inadequacy to effect such pollination as is required by Darwin's theory. Only in the southerly parts of our country and in very favourable weather have any observers recorded frequent visits, and even in such circumstances visitors are infrequent compared with those to other spring flowers. The lecturer's own observations on several different occasions in Wharfedale and Airedale in 1924 showed an almost entire lack of such visitors as could have any bearing upon Darwin's ideas. The following is a list compiled from the published observations of previous workers of all those visitors which could possibly bring about legitimate pollination in Darwin's sense, in the order of the frequency of their visits. Diptera : *Bombylius major*, *B. discolor*, *B. medius*. Hymenoptera : *Anthophora pilipes*, *Bombus hortorum*. Lepidoptera : *Gonepteryx rhamni*.

The inadequacy of these visitors for legitimate pollination suggests another class of insects, the night-flying moths, as probable agents of pollination.

Darwin, Lord Avebury, and, recently, Miller Christy have made this suggestion, pointing out that by its colour and night-scent the primrose is a typical moth flower. However, it has no support in observations, as up to the present, no night-flying moth has ever been seen to visit the primrose. The situation is, therefore, at present, puzzling, and it cannot be said that the problem has received any conclusive solution. Further observations would be particularly welcome. The lecturer left the problem in this inconclusive position after remarking :

1. That the habits of insects in visiting the flowers are involved in the question since all the flowers on one plant are of the same type,

if these are visited in succession there will be many more chances of 'illegitimate' than of legitimate pollination. 'Legitimate' pollination would only be frequent if the insect visitor frequently passed from a plant bearing one type of flower to a plant bearing the other type.

2. That if the insect folds up its proboscis between visits there can scarcely help being some disturbance of the exact position of the pollen required by Darwin's theory.

3. That the presence of hybrids, which occur whenever primroses and cowslips flower side by side and simultaneously, conclusively proves that a certain amount of cross pollination occurs. The difficult question is quantitative, 'How much?'

4. That it is not certain that the primrose is adequately pollinated. Some observers say that only 1 per cent. of flowers set seed in nature. If this be true, the remarkable and recently discovered partial sterility of the pollen may play some part in it.

The members had the pleasure of looking through the almost complete collection of British species of macro-lepidoptera formed by Mr. Barraclough.

An enjoyable meeting closed with cordial thanks to both Mr. Barraclough and Mr. Smith for the interest they had given.—B. MORLEY, Skelmanthorpe, December 6th, 1925.

—: o :—

Mr. A. Bennett has some 'Notes on British Carices,' in *The Transactions and Proceedings of the Botanical Society of Edinburgh*, Vol. XXIX., Part II.

*The Croydon Natural History and Scientific Society* continues to publish its *Proceedings and Transactions* in the familiar orange cover, those for the period February, 1923, to January, 1925, having been received (Vol. IX., Part 4, 5/- net). The Society has wisely reprinted its various programmes issued during the period, and gives a further instalment of the detailed meteorological reports which have been such a prominent feature in this publication for many years. It is to be regretted, on account of expense and for other reasons, these will be discontinued, but we understand the necessary records will be forwarded to the British Rainfall Organization. There are two presidential addresses by G. M. Davies entitled 'Geology and lines of Transport in the Croydon District,' and 'The Sea in Surrey' respectively, and as a frontispiece is a charming portrait of our old friend the late William Whitaker, F.R.S., to whom the Croydon Society owed so much.

*The Yorkshire Geological Society* certainly believes in variety so far as printing and paper are concerned, and the last part of its publication is printed by a Manchester firm, and is presumably a further step towards perfection, though the journal lacks its familiar appearance. The Society and its Editor are to be congratulated on producing a continuous series of articles bearing upon the geology of the county and its neighbourhood. The papers in the present section (Vol. XX., Part II.) are: 'The Glaciation of Borrowdale,' by A. Raistrick; 'U-shaped Markings on Estuarine Sandstone near Blea Wyke,' by J. W. Stather; 'U-shaped Burrows near Blea Wyke,' by F. A. Bather; 'The Beds underlying the Magnesian Limestone in Yorkshire,' by H. C. Versey; 'The Middle Permian Rocks of Yorkshire,' by H. C. Versey; 'The Millstone Grit and Yoredale Rocks of Nidderdale,' by Laurance H. Tonks; 'The Nature of the Junction between the Lower Carboniferous and the Millstone Grit of north-west Yorkshire,' by L. J. Chubb and R. G. S. Hudson; and 'Bibliography of Yorkshire Geology, 1924,' by T. Sheppard. We notice that both Mr. Stather and Dr. Bather begin their papers describing U-shaped markings, but after the first page or so these are referred to as V-shaped in the headings, to the end of each article. The illustrations certainly indicate that the U is the correct letter.

## NORTHERN NEWS.

At a recent meeting of the British Ecological Society Dr. T. W. Woodhead, M.Sc., was elected President of the Society for the years 1926-7 and 1927-8.

The death is announced of M. J. Nicoll, who, it will be remembered, made many additions to the Avifauna of Sussex, some of which, however, proved to have been escaped importations.

Mr. N. Silvester, M.Sc., has been appointed Deputy Curator of the Sunderland Museum in place of Mr. W. A. Smallcombe, B.Sc., who has been appointed Curator of the Public Museum at Reading.

*The Cleveland Scientific and Technical Institution* continues to issue its useful *Bulletin*, a monthly periodical containing abstracts of the more important scientific articles of interest to its members published during the month.

We have received from the British Museum (Natural History), London, a calendar for 1926, which contains a coloured portrait of Sir Hans Sloane; particulars of the museum's publications; staff; recent important acquisitions, and postal rates. The important acquisitions include 'about' 719 volumes of natural history books, including a number of rare editions not previously in the museum library, presented by Mr. E. Heron-Allen.

Early during the present year the Grantham Museum will be installed in its permanent home when the new Free Library building is opened. The museum is entirely due to the enthusiasm of its founder, Mr. Henry Preston, F.G.S., and it is suggested that a portrait by Mr. Grenville Manton, who has family associations with Grantham, should be presented. The cost of this will be £75, and Mr. Wilfrid Bond, of 11 Elmer Street, Grantham, is acting as Treasurer.

From circulars received we are agreeably surprised to learn that the settlement work and social service in Woolwich, which started in 1889 by a charming worker, C. H. Grinling, later assisted by Ethel Grinling and H. E. Grinling, at a cost of £1000 a year for the 36 years, is now likely to be on a better footing. During that period there has been a deficit of £3000, and this amount has been met by the same three. We wish there were more Grinlings in the world!

The Ministry of Agriculture and Fisheries has issued as Fishery Investigations, Series II., Vol. VIII., No. 4, 1925, 'Quantitative Studies on the Fauna of the Sea Bottom'; No. 2, 'Results of the Investigations in the Southern North Sea,' 1921-24, by F. M. Davis (50 pp., 5/- net). The tables and statistics of the various species collected, with details of their relative abundance and their possible connection with the plankton, etc., provide a wealth of material for study for the Marine Biologist.

Prof. P. F. Kendall, F.R.S., and Mr. Thos. Sheppard, M.Sc., were, at a largely attended meeting of the Yorkshire Conchological Society held in Leeds on Saturday, January 9th, 1926, unanimously elected Honorary Life Members. The proposal was made by Mr. Digby Firth, seconded by Mr. E. E. Gregory, and heartily supported by Mr. J. W. Taylor, M.Sc., Mr. Greevz Fysher and other members. The Society now has four hon. members, Messrs. Booth and Hartley and the above-named gentlemen.

At a recent meeting of the Geological Society of London, a communication was read on 'The Black Marl of Black Ven and Stonebarrow, in the Lias of the Dorset Coast,' by Dr. Lang and Dr. Spath. During the discussion which followed, Dr. Spath pointed out that, in a series of papers in *The Naturalist*, he had attempted to induce Yorkshire geologists to take up careful zonal collecting in Robin Hood's Bay. He did not think that subdivision would go on indefinitely: for, once we had for comparison the sequences of a number of suitable localities (including the Mediterranean Province), correlation would become simple and acceptable to all.

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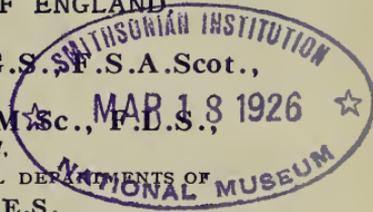
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## NOTES AND COMMENTS.

### NEOLITHIC REMAINS AGAIN.

We feel we must protest against the nature of the reports constantly appearing in the papers in reference to alleged Neolithic and other wonderful discoveries. It is not so long ago since a Yorkshire paper informed us, without a single scrap of evidence, that a Neolithic skeleton had been found at Grassington, and one paper even went so far as to say that this age was confirmed by a Professor at the Leeds University, who had not seen the remains. On writing to that person, however, he denied having made any such statement, but the paper did not apologise. We learn from several papers recently that remains of some human skeletons have been found at a depth of two feet in Wales. They are, as usual, 'of very early Neolithic age, and are *among the most important discoveries in Great Britain.*' The whole of the information is based upon *drawings of some parts* of the skeletons, which have been sent to Sir Arthur Keith. With all due respect to that authority, we deny that anyone can give an opinion upon the age of things of this character without more evidence than mere drawings.

### ASSOCIATED RELICS.

The fact that worked flint, the teeth of a dog (or wolf!), charcoal, and shell-fish remains were found may or may not have any connection with the burial. It is not so long ago that a skeleton was found beneath the boulder clay at Ipswich by certain 'Prehistorians' in that district. The bones were submitted to Sir Arthur Keith, whose report confirmed that they were of pre-Glacial age. Oddly enough the original discoverers subsequently agreed with Sir William Boyd Dawkins, who examined the site, that the skeleton was comparatively modern, and had been buried beneath the boulder clay as a result of a land-slip.

### SKELETONS AND FLINTS.

The fact that flint objects occur with skeletons, in circumstances such as those described in Wales, is no evidence whatever that they are contemporary in date with the skeletons. The late J. R. Mortimer, Canon Greenwell, and Thomas Boynton excavated hundreds of skeletons in the Yorkshire Wold area, and at many of their excavations I was present, and assisted. The present writer has also excavated both Saxon and Mediæval remains in many parts of East Yorkshire, and has found flints and other Neolithic remains associated with them, but this association is merely due to the fact that the bodies were buried among soil containing Neolithic objects. The report of the Welsh discovery goes on to say: 'Among the particularly valuable pieces of evidence found was a very large flint, *evidently deliberately*

*placed beneath the leg bone* of one of the skeletons. What possible proof could there be that this implement was deliberately placed beneath the *leg bone*? Surely, when the body was buried, it would be clothed in flesh, and the subsequent settling down as the flesh decayed makes it difficult to understand why this flint should have been deliberately 'put under the bone.'

#### FUNCTIONS OF MUSEUMS.

Mr. Eric Maclagan, Director of the Victoria and Albert Museum, in an address recently on 'The Functions of Museums,'\* states: 'If museums had no aim beyond the satisfaction of the collecting instinct, I am afraid we should find it difficult to justify the expense of their maintenance to the authority who holds the strings of the municipal or the national purse. They have, of course, a very much wider function than this. Their business is, on one side, to help living artists and craftsmen, and particularly young artists and craftsmen, by providing them with examples, not in order that they may copy them (except in so far as that copying is a part of their training), but in order that they may derive from them the inspiration which they require. And, on the other side, their business is to supply students with the material for their study, with actual objects which will supplement what they can find in books, or which will form the basis of original research and investigation. Here a difficulty comes in, for the head of the museum has to balance the claims of the practising artist and of the merely critical student, and this is never an easy business. The young artist is not always very sure what he does want to study, and sometimes when he is sure, his views do not agree with those of his pastors and masters. The critical student, whether young or old, knows very well what he wants, but is generally convinced that he is the only person whose wants are in any way reasonable. "Who looks at flint implements?" says the man who is eager for more water-colours; "Don't buy any more water-colours till the series of Palaeolithic gravers is at least reasonably complete," says the man who devotes himself to flint implements; and they very likely both agree that stuffed birds are a waste of money. But anyone who is concerned with the management of a museum soon finds out that if he is seldom able to please himself he is hardly ever able to please anybody else, and he accepts that kind of criticism as part of the day's business. So long as the artist and student keep on coming in, they may grumble as much as they please, but we may be sure that they are finding something at any rate of what they need.

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\* See *Museums Journal*, December, pp. 161-162.

And beyond both of these aims there is a higher task which some museums at least are privileged to attempt. I mean the preservation and exhibition of works of art with the object not of stimulating curiosity or satisfying acquisitiveness, not of helping artistic effort or of widening knowledge, but of providing the highest of pleasures for those who are capable of enjoying them. "Masterpieces" is a big word, perhaps, but a masterpiece—and I need hardly say that by a masterpiece I do not necessarily mean a picture in oil or water-colour—is not always an expensive thing or a thing very difficult to obtain. And when a museum has become possessed of a real work of art, whether it is a woodcut bought for a few shillings, or a great tapestry, or a piece of finely designed furniture or a plain silver cup, then the curator of that museum is bound to do his best to show it in such a fashion that those who are fortunate enough to be able to taste its beauty will have no unnecessary hindrances put in their way. I believe most of the functions of a museum are directed along these four lines—the satisfaction of the collecting instinct, the assistance of practising artists, the advancement of learning, and the provision of æsthetic pleasure, and I do not think that even the humblest of them can legitimately be neglected.'

ALAS, POOR YORICK!

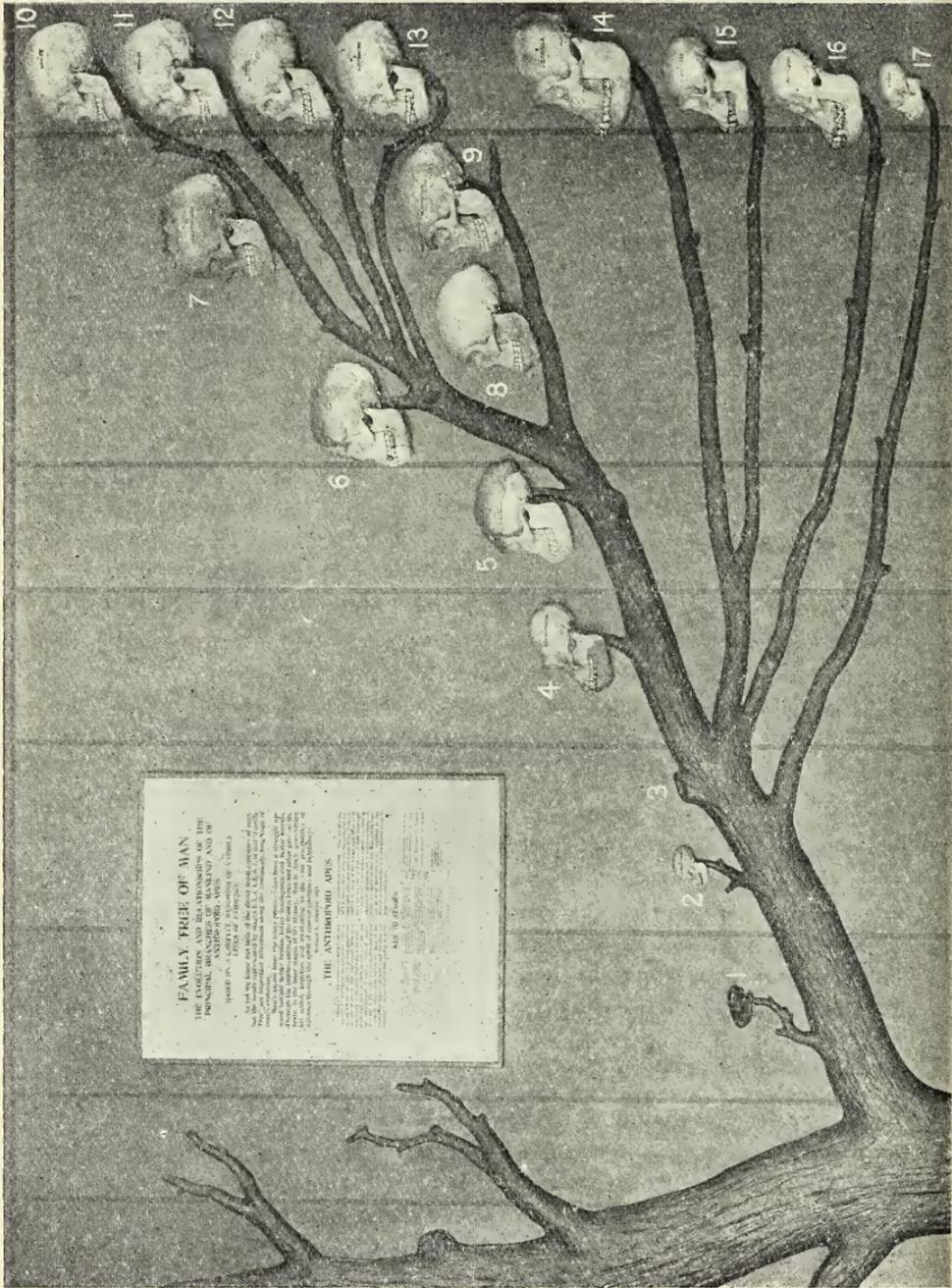
We observe from the press that Mr. Charles Walker, farmer, of Wilberfoss, has found some fragmentary human bones which have 'aroused considerable interest.' The specimens have been examined by the Rev. W. D. Wood Rees, Dr. Collinge, and 'the well-known London dental expert, Prof. Keith,' who opine that the bones are those of a woman. The press report goes on to say: 'It is *most likely* the skull *may prove* to be that of the round-headed type common in the Bronze Age,' and this information is repeated in *The Museums Journal*. Mr. Walker himself tells us that he found portions of a skull and several bones, but *nothing else, although he carefully dug round the skeleton himself*. In view of this, and the very fragmentary condition of the skull and bones, what possible evidence can there be that the skeleton is 'most likely of the Bronze Age'? It looks as if the greater the number of experts consulted, the greater the age of the bones!

THE AMERICAN AND EDUCATION.\*

This well-illustrated volume forms the Fifty-sixth Annual Report of the Trustees for the Year 1924 of the American Museum of Natural History, New York, and contains a record

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\* New York: American Museum of Natural History. xxii.+305 pp.



of the various expeditions carried out by the American Museum, and illustrates the wonderful life-like exhibits which are to be found in that influential and well-appreciated institution. Perhaps one of the most striking of the illustrations is that showing 'the family tree of man,' which occurs in the Department of Comparative Anatomy, and is described as 'Milestones along the road of man's evolution.' Through the kindness of the Director we are able to reproduce it.

## SCIENCE IN 1686.

In the interesting accounts of Early Science of Oxford appearing in *Nature*, we have the following miscellaneous series of observations under the date November 23rd, 1686. 'Mr. R. P., vicar of Kildwick in Yorkshyre, sent an account of a strange *eruption of waters*, June, 1686, in Craven. An account was communicated from one Tho. Wells in Oxford who cures himself of the *Gout* by drinking Beer, wherein mustard-seed has been Steeped. He likewise gives us an account of the great *herring fishing* trade lately begun in Summer-setshire, by ye coming of the Herrings up the Severn which was not known before this year. All things were prepared by Mr. Caswell for observing ye Eclipse on the Friday night, but the cloudiness of the night hindred him from makeing any observations. Dr. Plot communicated an account of a monstrous *Cucumber* growing in the garden of Dr. Wm. Jacob of Canterbury. Ye length was 3 foot ten inches and a quarter, ye girth circumference 9 inches.'

## BARNACLES, NOT BIRDS.

And under November 11th, 1684, we learn that: 'Mr. Charles Leigh communicated severall curiosities observed by him in Lancashire; particularly of Barnacles, which he takes to be a Shellfish, not a bird; of Caterpillars, concerning which he is of opinion, that ye old ones are killed by the younger; of worms in apple-kernells almost as large as ye kernells, which he urges as an argument against *omnia ex ovo*; unless perhaps ye egg rises with ye juyce of ye tree; of a peice of chalk of ye shape and bigness of a muscleshell, taken out of ye bladder of a hog. Of waters impregnated with Latrôn. Of a Water in that Countrey, which, by falling on wood, turns into a substance which rings like a bell. Of a water from a white marl 2 ounces in a quart lighter then common water usually is.'

## PRODUCTION OF OYSTERS.

In an article on 'The Production of Oysters (*O. edulis*) on English Beds in relation to New Observations on Breeding Phenomena,' in *Nature*, No. 2923, Mr. J. H. Orton states: 'The chief method of catching—or rather obtaining—oysters in England is that of scattering clean shells or laying tiles

on the oyster beds in the early summer, at the time the earliest batches of larvæ are judged ready to settle down from the free-swimming stage; in some localities the beds are also harrowed whereby buried shells may be turned over so that the soil can be washed off the recently embedded shells by the tidal current and a clean surface obtained in that way for the settling larvæ. Harrowing is also said to improve the growth of the older oysters. The clean shells, or cultch, are generally put out in mid-June, but may not be put out until a few weeks later if the summer is a late one and the oysters thereby delayed in spawning. The principles on which cultch is laid are that the oyster is an early summer spawner, that early spat grow to a larger size than late ones, that spat settle in numbers only in the warmer weather (when the temperature of the water is about 64° F.), that the surface on which the oyster larvæ can settle should be clean.

PROF. W. GARSTANG.

*Nature* for January 16th states: 'Prof. W. Garstang is both a naturalist and a poet, and is, therefore, appropriately equipped as an exponent of one who made Nature and man his chief poetic theme. Wordsworth felt himself to be a great high priest of Nature, and his spiritual insight was deep and penetrating. In the application of scientific truth to poetic purpose, he was as accurate and trustworthy as Tennyson, but not so rich or minute in his allusions to scientific knowledge. We do not for a moment suggest that the worth of poetry can be measured by the use made of such knowledge, but new natural phenomena and conceptions can extend the range of poetic thought and inspire that emotion which expresses itself in enduring verse. "Poetry," said Wordsworth, "is emotion recollected in tranquillity," and it differs from science in being the expression of individual feeling as an end in itself and not as a means of securing general assent to particular conceptions or interpretations of the theme. There is plenty of imagination in science, but it is disciplined and unemotional, and is put to the test of observation with the view of arriving at natural truths, whereas in poetry its object is the communication of pleasure by beautiful phrase or creative fancy. In ornithology there is but one description of the skylark, but in poetry there are scores, and each has a note of its own. That is why we find such poets as Keats, Shelley and Wordsworth interpreting the aspects and operations of Nature in ways that are differently beautiful. Keats by sympathetic human imagery; Shelley by changefulness and its symbolism, and Wordsworth by richness of allusions to everyday aspects of natural objects and events.'





Artificial light    60 minutes    10 minutes    2 minutes daily    Completely etiolated

Fig. 1.—*Pisum sativum*



Artificial light    60 minutes    10 minutes    2 minutes daily    Completely etiolated

Fig. 2.—*Vicia Faba L.*

## LIGHT UPON GROWTH.

J. H. PRIESTLEY, D.S.O., B.SC., F.L.S.

(Continued from page 44).

### ETIOLATION.

The general characteristics of the etiolated broad bean or pea are very well known, and are illustrated in Plates I., II., III. and IV. These plates also emphasize a further point; that the truly etiolated plant is seldom seen, because it is looked at too often! The mere removal of the plant from darkness to daylight on successive days for inspection will effectually prevent the plant from continuing to show the characteristics of true etiolation. This observation throws a flood of light upon the contradictions between earlier observers (9). It has necessitated the growth of plants in dark cupboards in a dark room in which they can be examined occasionally by dull red light, with all the precautions used in developing a photographic negative. In some of the cupboards electric lamps have been placed, controlled by clockwork devices which enable them to be switched on for two minutes, ten minutes, or one hour each day. Thus have been grown the plants shown in Plates III. and IV., and it will be seen that even two minutes light each day from a 100 watt electric lamp has been enough to produce much more leaf development. With ten minutes light exposure many of the leaves are well developed; they are still, however, quite yellow and unable to conduct photosynthesis. Thus an important point is established that the change in form of the plant in the light is not the indirect result of photosynthetic products formed in the leaf.

The curious plumular hook, found at the apex of the etiolated plant, disappears after two minutes illumination each day (Plates III. and IV.). Text fig. 5 shows that the vascular supply of the shoot runs through the plumular hook to the true growing apex. After the separation from the bud of the first two scale leaves, the lowest leaf initial of the bud is always to be found on the outer side of the hook. As the leaf breaks away from the bud and is left behind on a node, the axis curved in the plumular hook will be found to have twisted so that the next lowest leaf initial, although on the opposite side of the stem, will be found now to be on the upper side of the plumular hook (12, *loc. cit.*, p. 494). The tissue of the plumular hook itself is well worth study. As usual the apex of the bud is composed of meristem, covering the apex and running into the leaf initials crowded upon it, but this apical tissue seems to be making no growth, the leaf initials are not enlarging, it is doubtful if *any* new ones form

during growth in complete darkness. On the other hand unusual cell activity is to be seen in the internode which is curved in the plumular hook ; all across the stem meristematic cells are actively dividing. It would appear that during growth in darkness meristematic activity in the superficial layers at the apex has much diminished, but has increased in the layers of cells lying nearer the vascular supply which contains the nutrient sap. These cells cease to divide first and enlarge in size as they distend with water, on the side of the hook which is outermost, and it seems inevitable that this should be connected with the vascular system which runs around the hook to the leaf which is on the outer side of the

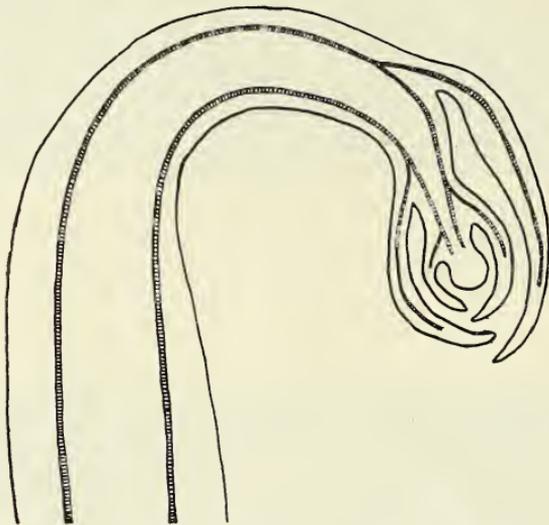


FIG. 5.—Diagram of plumular hook in vertical section, showing insertion of leaves and the course of the vascular bundles.

hook (10). But if this is so, then the existence of the hook is the result of the development in darkness of a shoot with leaves alternately placed and with possibly a particular type of vascular supply. This conclusion is at first sight a little unexpected, but it appears to be correct. No plants with opposite leaves seem to be recorded as forming a plumular hook, whilst many, but not all plants with alternate leaves develop it when grown in darkness. These data will be placed on record elsewhere, when the reasons for this interpretation of the plumular hook will be stated more fully (10). It will be seen that it accounts for the non-appearance of the structure in many etiolated shoots, although there is no reason to assume from the teleological standpoint that they are less in need of protection as they push through the ground. The conclusion has then been reached that the form of the etiolated

plant is largely determined by a change in the distribution of the dividing cells.

In the light of the preceding section, such a redistribution of meristem might be connected with nourishment. It is, therefore, significant that the walls of the meristem cells are found to be chemically different; they react less readily for cellulose, a difference probably due to more fatty substances in the wall (13), especially as there seems to be less fat at the surface as a cuticle (6).

During the last few months, further evidence has accumulated on this point by use of another method, and will be published in detail shortly (10). Cessation of division in a meristematic cell is always accompanied by the entry of water into the cell; the sap so accumulated forms a vacuole

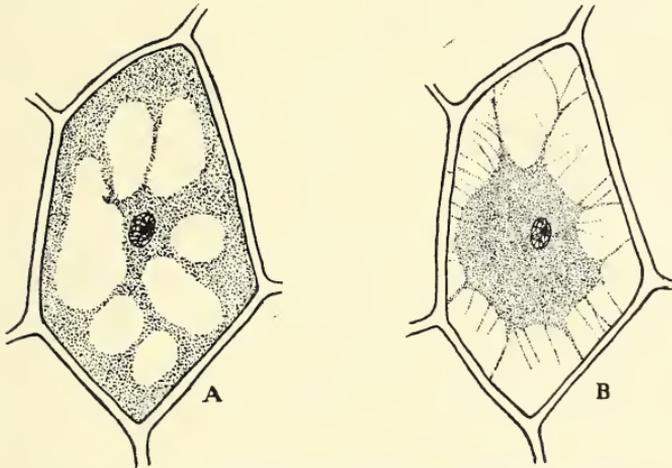


FIG. 6.—Diagram of a normal vacuolated cell A, and the same cell when plasmolysed (B).

within the protoplast; the cell enlarges, stretches and thickens the wall. The water can be withdrawn from such a vacuolated cell by placing it in a solution which is more concentrated than the sap of the vacuole.

The withdrawal of this water reduces the pressure which was distending the soft gelatinous bag of protoplasm, and this now usually collapses away from the wall, although it may remain still attached to it by fine protoplasmic threads (text fig. 6). A cell in this condition is said to be plasmolysed.

When, however, the attempt is made to plasmolyse the cells of a slice taken from the stem of an etiolated plant just below the apex, only the protoplasts of the pith withdraw from the walls, however strong the solution. Many of the cells of the cortex possess vacuoles, but though the external solution is amply strong enough to withdraw the water from the vacuoles, the protoplast refuses to contract away from the

cellulose wall. It is suggested that the reason for this is that the surface of the protoplast is as yet too firmly embedded in the wall, and as the surface of the protoplast consists mainly of protein and fatty substances, this is only another way of saying that the wall of the etiolated cell is impregnated with protein and fat. If this fact is responsible for the failure of the food supply from the vascular system to diffuse outward to the superficial cell of the meristem, it will be remembered that the development of these superficial meristems could be promoted by so short a light exposure as two minutes a day. It is, therefore, of great interest to find that after an etiolated shoot has been exposed to artificial light for two minutes on three successive days, the cells of the cortex can be plasmolysed (10). Thus light intensities of the order to produce leaf development and remove the plumular hook, enable plasmolysis of the cortical cells to take place. This should mean that fatty and protein substances less intimately embed the protoplast in the cell wall, and the disappearance of these substances would explain the ready diffusion of the nutrient substances required to nourish a superficial meristem.

When, further, it is realised that in the plants grown in darkness, where there is reason to assume retention of fats on internal walls, there is the further evidence for their presence, that a varnish-like layer, a Casparian strip, is left in a typical endodermal cylinder, in plants grown in the dark and not in the light (8), it will be seen that both observations and experiments seem to support consistently this interpretation of the phenomena of etiolation in terms of meristem development.

Other associated phenomena must be briefly passed over. In the normal potato plant the stem has leafy wings to its angles, in the etiolated shoot the leaves are left as little scales, the cortical wings are absent, and the stem is roughly circular in section (text fig. 1). In other words, the etiolated stem has somewhat the structure of the typical tuber-bearing stolon. Both possess a functional endodermis, which is absent in the normal leafy shoot, in which, therefore, cortical wing growths are fully nourished. When the stolon swells out into the tuber the endodermis ceases to form. This process still requires investigation; but it is already intelligible why, when tubers arise in the axils of leaves on the potato haulm in light, these tubers are borne straight upon the stem, and no stolon is formed.

#### DIRECTION OF GROWTH IN LIGHT.

The case has now been made for the consideration of an alternative 'causal' view as to the interpretation of some of the most commonly observed effects produced by light

upon the growth of the shoot. When such a standpoint is reached it inevitably opens a new vista in which old and familiar facts appear in a new light. Perhaps one example of the utility of the new standpoint may be permitted.

No facts are more familiar than the effects of light upon the direction of growth when that light falls sideways on the plant. As a general rule the shoot axis bends towards the light, the leaves placing themselves at right angles to it ; while the roots are insensitive, or in some cases bend away from it (text fig. 7).

As frequently happens in plant physiology, current inter-

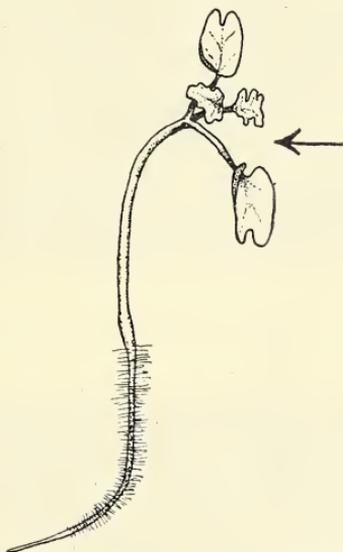


FIG. 7.—Direction of growth of shoot and root of white mustard, in lateral light from direction of arrow. (After Prof. Maclean Thompson's figure in 'Botany of the Living Plant,' by F. O. Bower, London, 1919).

pretations of these phenomena are very much influenced by somewhat analogous behaviour in the animal world, where an advanced system of sense organs are present to perceive such external stimuli, and, as a result, a wonderfully co-ordinated mechanism is controlled, mainly through a nervous system, in movement or in growth. Based on such analogies, the directive growth of the plant is interpreted in terms of perception of stimulus (and special sense organs for the perception of the direction of light have been reported), and then the subsequent response. The co-ordination mechanism in the plant by which directed growth follows upon perception, has provided a difficulty ; it has been met sometimes by vague reliance upon the fine protoplasmic threads which link the

protoplasts together through the walls, but such a view is inadequate even as a guess; it provides no information as to the machinery by which the perception of the stimulus is translated into a curvature, the mechanism of which is unequal growth. When the nervous system connecting the duodenum with the pancreas is severed, entry of food into the former is still followed by the excretion of a digestive fluid from the pancreas into the stomach. The stimulus given to the duodenum seems to be transmitted to the pancreas in the animal in this case by other means than by the nerves, and Bayliss and Starling traced its transmission to the transfer in the blood of a chemical substance, 'secretin,' to the tissues of the pancreas. Such chemical messengers, definite chemical substances producing specific reaction on their arrival at the reacting centre, have been termed hormones, and such a concept has proved too tempting to the plant physiologist, with the result that the literature of the past few years teems with invocations of hormones, which are made responsible for directive movements in response to stimuli, regenerative processes in response to injury, etc., etc. It is well for us to remember that to date all these suggestions in the case of the plant are little better than guesses; and in no case is there any satisfactory experimental demonstration of the existence and functioning of a hormone in the vascular plant, such as was shown by Bayliss and Starling, of the first identified hormone, before it was permitted to make its *début* in the literature.

From the present standpoint, there is a suspicion that all this talk of perception of stimulus and response, of perception in one area, transmission of the stimulus and response in another, is as mists that greater daylight will dispel. If, then, instead, attention is fixed upon the complicated machinery responsible for growth at each growing apex of the plant, and its delicate sensitiveness to the external conditions under which it functions, it may well appear that until the full effect upon this delicate machinery of such a condition, as lateral illumination, has been considered, it would be unwise to invent other hypotheses to account for the facts.

And, indeed, from the present standpoint, the lateral response to light of one of the most sensitive types of plant, the etiolated shoot, seems completely explicable. Blaauw (1) has recently examined with such an etiolated plant, the change in rate of growth produced by short exposures to artificial light, and the quantities of light employed are closely similar to those used in the growth of the plants represented in Plates III. and IV.

He finds that such short light exposures definitely *diminish* the rate of growth for a time, and that though this is followed



Completely etiolated      2 minutes      10 minutes      60 minutes artificial light

Fig. 1.—Later stage than Plate III., fig. 1



Completely etiolated      2 minutes      10 minutes      60 minutes artificial light

Fig. 2.—Later stage than fig. 1.  
*Pisum sativum.* Daily exposures.



by a recovery in darkness, it seems the final effect of the light is a diminution in growth as compared with continued progress in darkness. With similar light intensities it has now been shown that there is a *redistribution* of growth in the shoot, the same food supply being utilised now for superficial growth, leaf production, etc., instead of wholly utilised in growth in length. Obviously both these sets of data are correlated, and both form part of the full explanation why with lateral illumination such a shoot makes a positive tropic response, that is, grows towards the light. On the illuminated side, growth activity at the apex is redistributed, and becomes more superficial owing to the complicated series of changes previously considered. At the same time growth in length is diminished, and as the illuminated side thus grows less than the other, the result is a curvature towards the light, a positive phototropic response.

The behaviour of the root apex under lateral illumination is not so simple a problem. It is easily understood that many roots should be insensitive, as the growing meristem is not exposed at the surface of the apex. But the negative response of the sensitive root, such as that of white mustard (text fig. 7) is more difficult to comprehend. The following suggestions are only made, therefore, to indicate the possibilities from our present standpoint. With further experimental work they may well undergo modification.

Blaauw has shown that the positive phototropic curvature of a unicellular filament such as the hypha, bearing the sporangium of *Phycomyces* is due, not to diminished growth on short light exposure, but to an increased rate of growth (2). But an increase in extension in length in this case will be due, not to greater growth in the sense of meristematic activity on the outer side of the curve (A of text fig. 8), but to the greater extension of this side of the hypha under the pressure of the sap contained in the hypha.

Furthermore, as Blauw has shown, and as can be illustrated by simple experiment, in such a pellucid tube filled with liquid, the wall at A is more brightly lit than the wall at B, due to the lens action of the transparent cylinder of sap. The difference of illumination is then a greater illumination on the *wall* A, and as a result a greater extensibility of the wall. But in a multicellular root, we have behind the patch of meristem in the apex a mass of cells which are vacuolated, turgid with sap, and pressing vigorously against these containing walls. In such a mass of cells, the walls on the side B, toward the light (text fig. 3), will be more brightly illuminated. If, then, they behave like the similar turgid cells of *Phycomyces*, they will stretch more than the walls on side A ; B will then be the longer side, and curvature away

from the light. This is only a hypothesis, but it brings the facts of tropic curvature in roots in line with the observations of Ursprung and Blum upon the curvature of roots in response to gravity. The factors at work in the turgid cells in the regions A and B are the osmotic pressure of the sap in the vacuole, which tends to distend the cell, and the balancing pressure of the wall which resists such distension. Ursprung and Blum have shown that whilst the osmotic pressure is at its highest at the apex, that is when first a vacuole with sap appears, there is a zone a little way behind the apex where the resistance of the wall is least (14).

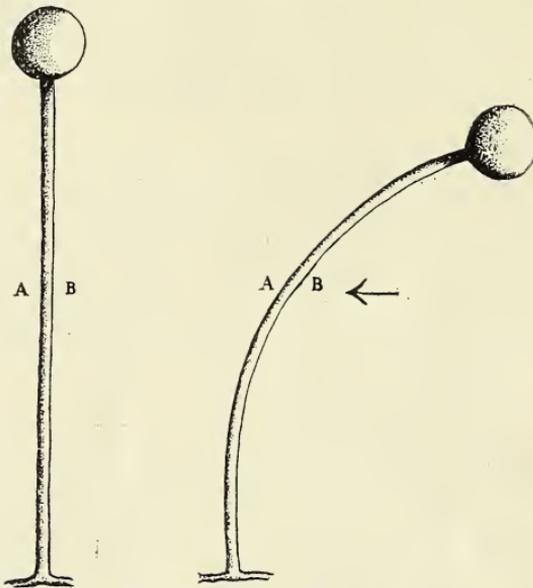


FIG. 8.—Curvature of sporangiophore of *Phycomyces* to light coming from direction of arrow.

Obviously the wall as it changes in the developing tissue passes through a phase of maximum extensibility. At this stage osmotic pressure within is still high, and maximum elongation of the cells takes place.

Ursprung and Blum have further shown that in the region of geotropic curvature, the cells on the outer side of the bend have the same osmotic pressure as those on the inner, shorter side, but they have a smaller resistance to stretching. Then, similarly, it is to be expected that on the outer side of the curve of the root, under negative phototropic curvature, the walls will prove to be more extensible, and thus responsible for the greater length of the cells, and thus of this side of the root. This is the more brightly illuminated side, and is precisely the change in the wall, as the result of illumination, that Blaauw has demonstrated to take place in *Phycomyces*.

It is hoped, therefore, that this brief review, first of the facts of growth of some higher plants in darkness, and its modification by light, and then of the speculations as to the causes of the directive action of unilateral light, undertaken from the standpoint of the study of development, may have shown that this 'causal' standpoint has its contribution to make towards an interpretation of the complicated phenomena of the life and growth of plants. And, further, that in many cases where a teleological interpretation of such phenomena has been accepted without critical support from experiment and observation, it may be well to suspend judgment as to the adequacy of such teleological hypotheses until the phenomena have been thoroughly examined from this causal standpoint.

It should be stated, in conclusion, that in the brief statement of the 'causal' point of view as to the phenomena of etiolation, the writer has drawn upon the results of a series of research students who have worked in the Botanical Department at Leeds. Much of this work has been repeated under more critical conditions by two research assistants in the Department, Miss R. M. Tupper-Carey and Miss Ursula Tetley, to whom also the writer's thanks are due for the figures illustrating the text. The photographs in Plates I. to IV. are by the University photographer, Mr. Manby.

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'A Contribution to the Geology of Great Orme's Head,' with notes on Other Areas,' by Dr. Louis B. Smyth, appear in *The Scientific Proceedings of the Royal Dublin Society* for January.

In Volume LVIII. of the *Archiv für Molluskenkunde*, Mr. Hans Schlesch has an illustrated paper, 'Beitrag zur Molluskenfauna von Schleswig mit besonderer Berücksichtigung der Umgebung von Flensburg.'

J Stuart Thomson's Presidential Address on 'The Study of Plankton,' and E. Morton's 'Rock Textures and Structures from an Applied Aspect,' appear in *The Annual Report and Transactions of the Manchester Microscopical Society*.

The Palæontographical Society has issued Vol. LXXVII. of its valuable monographs, and this includes 'The Gault Ammonites,' by Dr. L. F. Spath; 'The Macrurous Crustacea,' by Henry Woods; and 'The Upper Eocene Flora of Hordle,' by Miss M. E. J. Chandler.

In the excellent *Proceedings of the Llandudno, Colwyn Bay and District Field Club*, Vol. X., is a fine record of the prehistoric, zoological and botanical features of the area covered by the Society's activities, and, incidentally, there are notes on 'Hut Circles in the Lake District,' with illustrations.

*The Journal of the East Africa and Uganda Natural History Society* (No. 20), contains a lengthy paper by Prof. E. B. Poulton on '*Papilio* [?] *Papilio* dardanus. The most interesting butterfly in the world,' which occurs in the Nairobi area. The paper is well illustrated by coloured and other plates.

In a paper on 'The Alongside Drifting of Beach Material,' in *The Proceedings of the Geologists' Association*, just issued, Mr. J. W. Marsh says that, with regard to the East Coast, 'The general drift is in a southerly direction, as shown, for example, by the shape of Spurn Head, and the diversion of the Rivers Yare and Alde.'

Mr. T. Petch favours us with a further series of memoirs dealing with various aspects of Fungi, etc., of Ceylon, reprinted from *The Annals of the Royal Botanic Gardens, Peradeniya*. These deal with *Clathrus crispatus* Thwaites; *Cæsalpinia bonduc* L. and *Cæsalpinia bonducella* Flem.; Clavariæ; Thelephoraceæ; *Epipogon nutans*; and Additions to Ceylon Fungi, III.

*The Report of the Manchester Museum* gives a summary of the year's work of that important Institution, describing in detail what has been accomplished in the various sections of the Museum's interests. It forms Museum Publication No. 90, and is sold at sixpence. Among the *Notes from the Manchester Museum*, recently published, are: No. 28, 'Some Collembola from Southern New Zealand,' by G. H. Carpenter (Price 2/-); and No. 29, 'The Distribution of *Margaritana margaritifera* in the British Islands,' by J. W. Jackson (Price 1/6).

## ZOOLOGICAL NOMENCLATURE AND SYSTEMATIC WORK.\*

DR. F. A. BATHER, F.R.S., F.G.S.

I AM glad to have the opportunity to come from the Geological Department of the British Museum to throw stones at the neontologists. It is a long time since Zoology meant Systematic Zoology. Our workers, having built a great hall of Comparative Anatomy and Morphology, are now erecting wings and turrets of Cytology, Experimental Morphology and Embryology, Oecology, and Genetics. But whatever a zoologist may be or become, he remains a zoologist in virtue of the fact that his subject-matter is drawn from animals.

If you are going to talk about animals, it is as necessary that you should speak of them by their correct names as that a chemist should give the correct names and formulæ of his compounds. A chemist to-day does not say that he has been experimenting with some salt of lead, or investigating a brown derivate of coal tar; no, he gives its precise name, which often is far more complicated than any name which the zoologist has to use. The chemist does not even speak of lead: he states which isotope of lead he is working with. The zoologist, on the other hand, is not ashamed to record experiments (quite valuable experiments too) on 'the common sea-urchin,' or 'the starfish of our coasts.' Who can tell me what he means? Yes! but each hearer has in mind a different animal.

I do not plead for a strict adherence to the International Rules of Nomenclature in every occasional publication. Though a member of the International Commission, I am no priority 'fan.' I ask only that the zoologist shall be at as much pains to determine his material as the chemist is to be sure of the purity of his salts, and that he shall use a name which can be recognised, whether it be technically and strictly correct or no. If there be any room for doubt, it is quite easy to refer to a figure or description in the latest accessible monograph. Indeed, this would be a helpful practice in all cases.

I insist on this careful determination and naming in the interests of zoologists themselves. Species, sub-species, and even sub-sub-species do differ from one another in their reactions to the environment or to laboratory stimuli, and

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\* Report of the opening remarks in a discussion on 'The Importance of writers on Zoological subjects following the generally accepted rules of Zoological nomenclature and systematic work,' given at the third Annual Meeting of British Zoologists held in the rooms of the Zoological Society, London, on January 9th.

it is merely amateurish to use such omnibus appellations as those quoted.

And then I ask that the zoologist shall set forth his name in accordance with the generally accepted usage of systematists. Just as the shifting of a letter in the formulæ of the benzene ring may indicate a poison instead of a perfume, so the wrong position of a bracket may make nonsense or worse of a zoological name. Often it really is difficult to decide what one of these careless writers means. To say the least, want of attention to these matters is not good form.

To turn to the description of new genera and species. You may not be competent to draw up a decent diagnosis (even if you understand what is meant by that term), but you can follow the rules. If you think you are establishing a new genus, you can say so, and not leave us to guess the fact. The same with a new species. You will then be blessed and not cursed by the angels—the recording angels of the Zoological Society. If you are properly diffident of your powers of definition, then you can fix on a genotype or type-species for your genus, and a holotype or type-specimen for your species. This, of course, is the ideal for every foundation of a new name. To omit it is to breed confusion; to adopt it is the readiest way of ensuring immortality.

There are, indeed, writers of a little learning who bravely attempt to use such terms as holotype, cotype or syntype, paratype and the rest. But since they have not been at the pains to find out what the terms mean, they only make confusion worse confounded. These people make up the Jazz Band of Zoology.

I am not exaggerating. I am perfectly serious. I read much of this syncopated literature, and experience of the past demonstrates what trouble it is sowing for the future. Not to weary you with examples, I pick up a recent number of a leading journal (a most superior publication, in a light-blue cover), and turn to the very good description of a new animal by a teacher of both biology and zoology; if he should recognise my account of his work, I trust he will forgive me, and will appreciate the honour of serving as whipping-boy for so distinguished a gathering of equally meritorious colleagues.

From his first paragraph it follows that the very title of his paper is incorrect, and that he does not know how to distinguish, in writing, between a subgeneric name and a synonym. I do him the justice to say that he attempts a sort of diagnosis; but it appears from his paper that he regards certain organs, which I will here call 'the gills,' as most important structures for specific differentiation within the genus. This is how his diagnosis treats them:

'The gills are characteristic (*vide* text).' He selects no holotype, and fails to say where his type-material is preserved for reference by future workers.

But these faults are venial compared with what remains behind. He finds in his animals something he takes to be a symbiotic alga. He does not say that it represents a new genus and species, but he suggests a name, twelve syllables long, of which, I am informed by our chief algologist, both the generic and specific components appear to be new. I must read his sole description: 'hollow spherical masses composed of a transparent matrix in which are embedded numerous minute spherical green bodies.' Measurements? No!

This meeting will now, I trust, agree to my thesis, which states 'the importance of writers on Zoological subjects following the generally accepted rules of Zoological nomenclature and systematic work.' Systematics is a base part of Zoology. Granted. It is the foundation. You cannot help using it for the erection of your superstructures. Therefore, you must use it correctly, and your students must be trained to do likewise. And there is another reason. The philosophical systematist follows all your additions to the fabric with intense interest, knowing that some day it will fall to him to set the coping-stone to the work.

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### THE LEEDS NATURALISTS' CLUB.

THE Session for 1926 was opened with a *Conversazione* on Monday, January 18th, in the Botanical department of the University. The President, Mr. H. Whitehead, welcomed a large gathering of members, and many guests.

The evening was spent in viewing the exhibits by members, comprising Lepidoptera; a long range of beetles; Sphagna from Ringing Keld bog; Derbyshire minerals; Fossil plants from Devonian and coal measures and Jurassic plants from the Yorkshire coast; lambs to illustrate the Mendelian story of the Wensleydale sheep; photographs of fungi in their habitat; the Warth grain colour screen, with diatom type slide; young *Asterina gibbosa*; models of the structure of a bird's feathers; Herbarium sheets to illustrate the August flora of Humphrey Head, N. Lancashire; Rare plants from the South of England; the August flora of Lockton, Pickering, Whitby and Sinnington; birds of the Crow family; and a box to illustrate Batesian mimicry in British insects.

During the evening were shown Lantern slides tracing the course of the Wharfe; others of Ingleborough, Robin Rocks, Pecka Falls, Old Sarum and Stonehenge; snow photographs of Adel and Meanwood; and bramble-gorse and holly with covering of frost; and colour photographs of Orchids.

The Club has had its meetings well attended during the past year, and has increased its membership.

The new Syllabus contains many interesting subjects and some novel features, and with an access of new members gives the prospect of a good year's work.

The Lecture Session was opened on February 8th, by Prof. Gilligan, on 'Rock forming minerals,' illustrated by lantern slides, and slides under petrological microscopes.

## NEW BOTANICAL BOOKS.

**The Classification of Flowering Plants, Vol. II., Dicotyledons,** by **A. B. Rendle, M.A., D.Sc., F.R.S.** Cambridge Press, 1925, xix.+636 pp., 30/- net. When Dr. Rendle's first volume of flowering plants was issued, botanists felt they were to be in possession of a reliable and useful guide, but no second volume appeared to complete the work. At last, after an interval of twenty years, volume two has been published by the Cambridge Press. This is a larger volume than the preceding one, and runs to 636 pages. The general arrangement is that of Engler's 'Syllabus.' The most important departure from Engler's system is the retention of the familiar 'Monochlamydeæ' of English botanists, including 31 families, ranging from Salicaceæ to, and including, Caryophyllaceæ. This is a convenient group, and the reasons for its retention are that while it is impossible, with our present knowledge, to construct a phylogenetic system of Angiosperms, we have in this group grades of differentiation of floral structure from a comparatively simple type of flower up to a higher type like that of Caryophyllaceæ, and in the order Centrospermæ this higher type exists alongside the simple monochlamydeous type. Students will find in this work many interesting and unfamiliar details of structure and development clearly and simply explained. The book is well printed, and the illustrations are excellent. This long-expected volume will be welcome to every botanist, and no English author was better fitted for the task than Dr. Rendle.

**Photosynthesis,** by **Walter Styles, Sc.D.** London: Longmans, Green, 1925, vi.+268 pp., 16/- net. Botanists generally have been greatly indebted to Prof. Styles for his indefatigable labours on the literature of photosynthesis, the assimilation of carbon by green plants. His earlier work, written in conjunction with Mr. I. Jørgensen, proved a great boon to both teacher and student, but as this has been long out of print, the present work is very welcome. It is more general in its scope than the earlier one, but deals in a very adequate manner with the more recent advances in this important branch of plant physiology. As an indication of the enormous amount of work done on the subject, more than 870 references to literature are made in the text, and these are by no means exhaustive; details of these are given in a bibliography at the end of the volume, extending to over 40 pages. Notwithstanding all the labours of the past century, we are still ignorant of what is actually taking place in the daily life of the living cell of a green plant, and the author has to admit that while it is possible to bring about the production of sugar from carbon dioxide and water outside the plant, in more than one way, the conditions necessary for affecting this are vastly different from those which prevail in the plant. For the production of carbohydrate it is necessary that chlorophyll should be present in the living cell, and in nearly all cases in the chloroplasts. At least one other constituent of the plastid, of cell protoplasm, or some physical condition of material is an essential factor in the process. What this factor is, is at present quite unknown. This work is invaluable to all advanced students, and should be in every botanical library.

**A Class Book of Botany,** by **E. Stenhouse, B.Sc.** London: Macmillan, 1925, vii.+514 pp., 7/6 net. This will prove a useful book to those studying botany for matriculation or examinations of similar standard, and it has been written primarily for the use of such students. Commencing with the seed and germination, morphology and physiology of the several plant organs are dealt with, and this section concludes with an account of the study of plants in their homes. The second part deals with reproduction and classification, also some common British trees, some common flowerless plants, and a chapter on evolution and heredity. There are also appendices on chemical tests, glossary, phenological list, and a monthly calendar of wild and garden plants. The book is well illustrated by 363 figures, many from photographs.

## ADDITIONS TO THE YORKSHIRE DIPTERA LIST.

CHRIS. A. CHEETHAM.

IN writing up the following list I have brought forward additions which have been mentioned in reports of Y.N.U. excursions, or reported in other publications, it having been pointed out to me that these scattered records are difficult to trace to non-members of our Union, and a full list very desirable.

I have again to thank Messrs. Collin, Edwards and Grimshaw for help and advice; their initials are added in brackets to species they have verified.

- Macrocera vittata* Mg. (Edw., *Trans. Ent. Soc. Lond.*, 1924, p. 519).  
See Coxley, Askham Y.N.U. excursion, 1925, pp. 240, 283.
- Chironomus tarsalis* Wlk. Rawdon Crag Wood, 9/7/25, C.A.C.
- Anopheles plumbeus* Sph. (*nigripes* Staeg.). Rawdon, 15/6/25, C.A.C.
- Finlaya geniculata* Oliver (*C. lateralis*). Rawdon, 28/6/25, C.A.C.
- Dicranomyia pseudomorio* Alex. Inglebro', C.A.C. (F.W.E.).
- Tabanus cordiger* W. Nidd, 20/6/25, C.A.C.
- Beris Morrisii* Dale. See Coxley Y.N.U. excursion, 1925, p. 240.
- Euthyneura Gyllenhalii* Zett. Pateley, F.W.E.; see Coxley.
- Empis vitripennis* Mg. Allerthorpe, 15/8/25, C.A.C.
- Rhamphomyia vesiculosa* Flin. See Teesdale Y.N.U. excursion, 1925, p. 250.
- Porphyrops spinicoxa* Loew. See Coxley.
- Xiphandrium monotrichum* Loew. See Coxley.
- Hypophyllus discipes* Ahr. Rawdon, 28/6/25, C.A.C.
- Chrysotoxum cautum* Harr. Allerthorpe, 21/6/25, C.A.C.
- Zodium cinereum* F. Allerthorpe, 21/6/25, C.A.C.
- Appendicia truncata* Ztt. Austwick, 18/5/19, C.A.C.
- Blepharomyia amplicornis* Ztt. Pateley, 26/8/23, C.A.C.
- Trichoparia seria* Mg. Farnley, 27/7/22, C.A.C.
- Lydina aenea* Mg. Wistow, 20/9/22, C.A.C.
- Tachina rustica* Fal. Skipwith, 3/9/21, C.A.C.
- Monochæta albicans* Fal. Austwick, 1/5/20, C.A.C.
- Voria trepida* Mg. Skipwith, 3/9/21, C.A.C.
- Ceromasia lepida* Mg. Skipwith, 20/8/24; Adel, 13/9/19, C.A.C.
- \**Cænoscia lineatipes* Zett. Rawdon, 23/7/23, C.A.C. (J.E.C.).
- C. means* Mg. Austwick, Gormire, Adel.
- C. rufipalpis* Mg. Allerthorpe, Farnley, Rawdon.
- Pseudocænoscia longicauda* Zett. Austwick, 13/9/25, C.A.C. (J.E.C.).
- Heteroneura ruficollis* Mg. Farnley, 29/6/21, C.A.C.
- H. nubila* Mg. Rawdon, 22/6/24, C.A.C.
- Chaetomus flavotestaceus* Ztt. (Czerny). See Coxley.
- C. confusus* Wahl. (Czerny), previously recorded as *Leria flavotestaceus* Ztt.
- Amaurosoma tibiella* Ztt. Austwick, 16/5/25, C.A.C.
- Sapromyza affinis* Ztt. See Teesdale, 1925, p. 250.
- Oxyina absinthii* F. (*Tephritis*). Rawdon, 28/6/25, C.A.C.
- Psilopus contristans* W. Allerthorpe, 21/6/25.
- Rhynchotrichops aculeipes* Zett. Fleet Moss, 1800 ft., June, 1919.

\* All the insects I had named *C. sexnotata* Mg. are this; it is a common species. Mr. Collin informs me that there are few records of the true *sexnotata*.

- Hylemyia floralis* Fal. Skipwith, 3/9/21.  
*Spilogona solitaria* Coll. Heseltine, 25/6/25.  
*Mydaea nivalis* Ztt. (Stein.). Thorns Ghyll, 2/6/25.  
*Hammomyia grisea* Flin. Allerthorpe, 15/8/25.  
*Macquartia nubilis* Rnd. Nidd, 29/8/25.

In *The Entomologists' Monthly Magazine*, 1925, p. 228, Mr. F. W. Edwards records the following :

- Dicranomyia occidua* Edw.  
*Sciara caudata* Walk. Previously recorded as *S. longiventris* Ztt. (synonym).  
*Pezomyia vanderwulpi* de Meij.  
*Psilosciara stokesi* Edw.  
*Aphiochæta projecta* Beck.  
*A. fungivora* Wood.  
*A. pleuralis* Wood.  
*A. limburgensis* Schm.

These were all bred by Mr. Edwards from a piece of an old log sent to him from Barnsley by Mr. E. G. Bayford.

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### FIELD NOTES.

**Black Redstart near Scarborough.**—On November 1st, 1925, I saw a male Black Redstart on 'Monkey Island,' near Scalby Mills, Scarborough.—T. N. ROBERTS.

**Red-necked Grebe at Scarborough.**—On December 23rd, 1925, a Red-necked Grebe visited the Mere at Scarborough. It stayed all day, but had left on the following morning, probably owing to the freezing of the water.—T. N. ROBERTS.

Mr. J. W. Clarke reports that this bird stayed several days on the Mere.—ED.

**Blue-throated Warbler at Scarborough.**—On Sunday, November 15th, I saw a small bird skulking in the privet hedge in my garden in Oak Road. At first I took it to be a Robin, but when it came into the open I saw that it was a Blue-throated Warbler. It was very tame, and allowed me to make a sketch of it at close quarters. As it was such a late date—nearly a month later than any previously recorded British occurrence—I sent my sketch to Mr. R. Fortune F.Z.S., who kindly confirmed my identification, stating that the bird was 'without doubt an adult female Bluethroat' of the Norwegian race. I saw the bird again on the following day, and on the 22nd, each time in my garden—on one occasion it entered the open door and explored the room. On the 21st it was in the garden of a neighbour in the same road, who asked me about it, and gave an accurate description. After waiting a month to see if the bird turned up again, I wrote the above on December 22nd. It again visited my garden on three occasions on December 23rd, once the following day, and again twice on December 26th, a sharp frost bringing

it down to feed with the other birds. On January 14th the recurrence of the hard weather brought it again. At the back of my house is a long neglected orchard which borders upon the Falsgrave Park, and it is from this retreat that the bird comes and goes. I have not seen it since up to the time of writing (January 3rd, 1926).—W. J. CLARKE, Scarborough.

**Palustrina jenkinsi var. coronata, near Hull.**—I send herewith a number of specimens of this species, obtained in May, 1925, from a small cattle pond closely adjoining the east bank of the River Hull about two miles from our Hull City boundary. They occur in very great numbers among a profusion of duckweed—chiefly *Lemna minor* with some *L. trisulca*. The examples have been examined by Mr. J. W. Taylor, M.Sc., who identifies them as *Pal. jenkinsi* var. *coronata*.—J. FRASER ROBINSON.

**A Heron in Bradford.**—At 11 a.m. on December 2nd, after two or three weeks of almost arctic weather, a Heron surprised the business men of Bradford by alighting in Swaine Street, in the centre of the city. The bird was promptly caught, and was taken in charge by the Bradford Telegraph Newspaper Company's people, who photographed it, and then sent it on to my warehouse. I was from home at the time, but my men 'housed' it under an inverted wool-sorting skep, and it was given water, fish and *bread*. I could not have done any better for it myself, but it refused to eat or drink, and only rarely attempted to get upon its legs, it was so exhausted. The following day the Telegraph Newspaper people called for it, and took it by motor car to Sir Mathew Wilson's estate at Eshton, and liberated it. (There is a heronry on the adjoining estate of Flasby.) I was not surprised to hear a few days after that it had died. This bird has probably established two small records, viz., being the first Heron to alight in the centre of the city of Bradford, and also being the first Heron to be the chief guest in a more than twenty mile's motor ride! No doubt many species of birds have suffered during this early cold spell of weather, when all the ponds, lakes and tarns were thickly frozen over, and the streams and rivers were partially frozen. But the local herons have not been seriously reduced. On December 13th, I went across the river to a large field, where the Herons usually assemble during the daytime to rest and sleep, and I put nine birds up. Herons dearly love the centre of a large field when they are resting, so that no one can approach without being seen, as they appear to rely much more on their eyes than their ears. I have at times suddenly come upon them, say, under the bank of a river or stream, and am inclined to think that their hearing is rather defective. The body of another Heron was exhibited at the Cage Birds

Show at Bradford on December 5th, and it was reported to have been found dead in St. James's Wholesale Market, also in the centre of Bradford, the day previously. A very pretty tale was being woven about it having come to look for its mate of two days previously! On enquiry at St. James's Market it appeared it had come in a crate of game birds, and being of no edible value, was sent to the bird show. It had apparently been trapped.—H. B. BOOTH, Ben Rhydding.

**Melanic Common Shrew in West Yorkshire.**—On the 6th February a small animal was found dead in the cardroom of the C.W.S. woollen mill at Dobcross, and sent to me. It was a Common Shrew (*Sorex araneus*), with the whole of the fur just about the colour of a mole, a slaty or smoky black. On the back was a small area with a faint brownish wash. The total length was 110 mm., tail 34 mm., head and body 76 mm.; and the teeth proved the species to be *S. araneus*, and not the Water Shrew. The latter species is frequently subject to melanism. Melanic Common Shrews are rare. In Barrett Hamilton's 'British Mammals' there is mention of an example taken in Norfolk in 1879, and I do not know of any other published record; but, a few years ago, I saw an Essex example in a small collection of melanic mammals belonging to Sir Drummond Smith. Probably this Dobcross animal had been killed by a cat and carried into the cardroom of the mill. I have known this happen (with normal coloured Shrews) in other mills, cotton or woollen; and Shrews are very often brought into houses by cats.—FREDK. J. STUBBS.

**The Adventures of a Fox.**—During the cub-hunting season, the Bramham Moor hounds, when out on the east side of the River Ouse, opposite Cawood, disturbed an old fox, which swam over the river, which is at least 60 yards wide. He then ran to a farm house and jumped through the glass window of the dining-room, greatly surprising the farmer and his family, who were at breakfast; he then took refuge in a shed in the garden used for storing apples, where he was imprisoned. About five feet from the ground was a hole six inches square covered with zinc: during the night the captive managed in some unaccountable manner to perform the seemingly impossible task of loosening the zinc and escaping through the small hole.—R. FORTUNE.

**Great Crested Grebe in a Cab.**—On Saturday, October 3rd, a Blackburn taxicab driver was greatly surprised to find a strange bird asleep in his cab. It proved to be a Great Crested Grebe. The daily papers, in their usual sensational manner, described it as very fierce, making a most unprovoked attack upon a policeman at the police station, where it had been taken after its arrest. It was sentenced to be turned down among the ducks in the local park.—R.F.

## CUMBERLAND COLEOPTERA IN 1925.

F. H. DAY, F.E.S.

IN my notes on this subject for 1924 (*The Naturalist*, 1925, p. 75), I mentioned that the Cumberland list of Coleoptera had reached a total of 1802 species. I have now a further eight species to bring forward, which raises the number to 1810. These are :—

*Haliplus nomax* B. Browne, Monkhill, taken in 1908 and 1909, but only lately determined.

*H. immaculatus* Gerh. Two specimens taken in the neighbourhood of Carlisle in 1903; Mr. Murray also took a pair at Sellafield in 1917.

*Olophrum nicholsoni* Donis. In flood refuse, Carlisle; a specimen also in 1924 at Orton, in moss.

*Oligota apicata* Er. Under bark on a fallen beech, Kingmoor.

*Trichopteryx fratercula* Matth. Mr. Britten tells me he has this species from Gt. Salkeld, taken by him in 1913.

*Gracilia minuta* F. Carlisle, several specimens.

*Meloë violaceus* Marsh. Mungrisdale, a fine female.

*Dryocetes alni* Georg. Mr. Britten reports this as abundant at Skirwith in September, 1924.

There is one species I wish to delete from the Cumberland list—*Ceuthorrhynchus timidus* Weise, our species being the much rarer *chalybæus* Germ., recognisable by the conspicuous patch of white on the breast. I have four specimens, two from Wreay, one from Kingmoor, and one from Gt. Salkeld. My friend, Mr. Britten, also has it from the last-named locality. My own specimens were swept in grassy meadows, or similar ground, where *Cardamine pratense* grows plentifully, which plant, I understand, is suspected of being its pabulum.

The beginning of 1925 was extremely wet, and there were tremendous floods in our local streams, many acres of low-lying land being submerged. As soon as opportunity could be found I brought home several bags of rubbish from the Rivers Petteril and Caldew. and although beetles were common enough in it the majority were of familiar species. Still I picked out *Notiophilus substriatus* Wat., *Bembidion prasinum* Duft., *Quedius umbrinus* Er., *Q. picipennis* Heer., *Philonthus puella* Nor., *Atheta oblonga* Er., *A. cavifrons* Shp., *Cryptohypnus dermestoides* Hbst. and *Orchestes foliorum* Müll. (*saliceti* F.). Of more special interest was a specimen of *Bythinus burrelli* Den. hitherto only found in Cumberland on Cross Fell; a second specimen of *Ephistemus globosus* Waltl. (*vide The Naturalist*, 1925, p. 75), and *Ips 4-guttatus* F., not recorded from Cumberland since T. J. Bold's time.

In March I examined loose bark on oak and other trees,

my best capture being *Deliphrum crenatum* Gr., which I first recorded from the county in the *E.M.M.*, 1921, p. 20. The present specimen came from Southwaite, where also *Epipeda plana* Gyll. occurred in profusion.

Work with the water net yielded among others *Hydroporus obscurus* Stm., *H. umbrosus* Gyll. and *Agabus affinis* Pk. from Mungrisdale Moss; *H. discretus* Fair., in numbers at Kingmoor, in a small stream much choked with watercress; *Helophorus ytenensis* Shp., and *Hydrochus brevis* Hbst., in the old Thurstonfield locality; *Agabus conspersus* Marsh., in brackish pools on Drumburgh Marsh, with *Helophorus mulsanti* Rye, in enormous numbers, especially in some deep and muddy ponds fouled by cattle. In a small stream of clear water, which runs through Bowscale Moss I found *Hydroporus 12-pustulatus* F., commonly in October, a species I have also taken in the spring.

At Floriston, in young dead herons, which had fallen from their nests after having been 'ringed' by some ornithologist, I took *Homalium septentrionis* Th., and in a dead rook at Durdar, *Atheta nigripes* Th. (*villosula* Kr.), *Autalia rivularis* Gr., *Philonthus nigriventris* Th., and *Oxytelus fairmairei* Pand.

Beating birch at Orton in June gave me a short series of *Corticaria ferruginea* Marsh., a species I have taken very sparingly before in Baron Wood. Sweeping in the meadows brought to light *Clinocara minor* Walk. (*tetratoma* Th.) and *Ceuthorrhynchus cochleariæ* Gyll., with numerous others. Always abundant here in damp, flowery meadows is *Telephorus figurata* Man., and as a result of examining a large number of specimens in the sweep-net I picked out one example of var. *scotica* Shp. I have not noticed this fine form here before. At Thurstonfield I took *Phyllotreta flexuosa* Ill., *Bagous nigratarsis* Th., *B. claudicans* Boh., and *Phytobius comari* Hbst. At Kirkbride, at the mouth of the Waver, in June, beetles were common, and I took *Haliplus apicalis* Th. again in numbers with, for the second year in succession, a single example of *Ochthebius viridis* Peyr. On mudbanks I captured *Dyschirius nitidus* Dj., *Bembidion lunatum* Duft. and *Tachypus pallipes* Duft., the last two freely; of *T. pallipes* I had only taken one previously in the county.

At midsummer I worked the hills near Mungrisdale, but as a result of the heat and drought they were not at all productive. The only *Carabus* I saw was a single *glabratus* Pk., the commoner species of the genus being quite absent. *Telephorus paludosus* Fall. was found under a stone among ants (*Myrmica* race *lobicornis* Nyl.), a strange habitat, but probably a casual one. In some beds of rushes, which in most seasons are treacherous quagmires, but were now almost dried up, I found a fair number of *Donacia affinis* Kunz., an insect I have

not noticed for many years. With it *D. discolor* Pz. occurred in a wonderful range of colour variation. The scarcity of beetle life on the mountains persisted throughout the year. I was on Saddleback in October, and the only capture worth noting was *Xylodromus depressus* Gr. (*deplanatus* Gyll.) right on the summit, doubtless drawn up in an air current, as many common lowland insects were present at the same time; some, such as *Atheta gregaria* Er. and *Enicmus minutus* L. in numbers, as also was an ant *Myrmica* race *ruginodis* Nyl. in the winged state.

One of my last captures was *Bradycellus verbasci* Duft., a strangely rare beetle here. I took one at Woodbank, on the south side of Carlisle, at the roots of a tree in the winter of 1897, the only previous capture I know of. The present specimen I took on the wing in Carlisle.

—: o :—

The Horniman Museum has issued Publication No. 15, dealing with **The Defences of Animals** (59 pp., price 6d.), illustrated by two plates. The first of these refers to Animals with Armour, illustrating the Bony Pike, Stump-tailed Lizard, Nine-banded Armadillo, and Indian Pangolin. The second illustrates Animals with Spines, and includes a Sea-Urchin, Moloch Lizard, Porcupine and Hedgehog.

**Sanctuaries for Birds and How to make them**, by **H. J. Massingham**. London: G. Bell & Sons, Ltd. 160 pp., 5/- net. The author discourses on the desirability of preserving certain areas for the benefit of bird life, gives useful hints on how to make a Sanctuary, and in addition describes existing protected areas such as the London Parks, those in Norfolk, The Farnes, and others under the charge of the Royal Society for the Protection of Birds, and the National Trust. There are illustrations of some typical species of British birds, and methods of preparing nesting boxes, feeding troughs, etc.

**The Birds of the Riviera**, being an account of the Avifauna of the Cote D'Azur from the Esterel Mountains to the Italian Frontier, by **Collingwood Ingram**. London: H. F. & G. Witherby. xv. + 155 pp., 12/6 net. This volume contains particulars of the various species occurring in the area referred to in the sub-title of the book, the remarks being enlivened by sketches in the text by the author, and plates from drawings by L. P. Robert, W. Seaby, O. Murray Dixon, W. Austen, G. E. Lodge and A. Thorburn. The volume will prove exceedingly useful to visitors to the Riviera, as well as helpful to those interested in the distribution of birds generally.

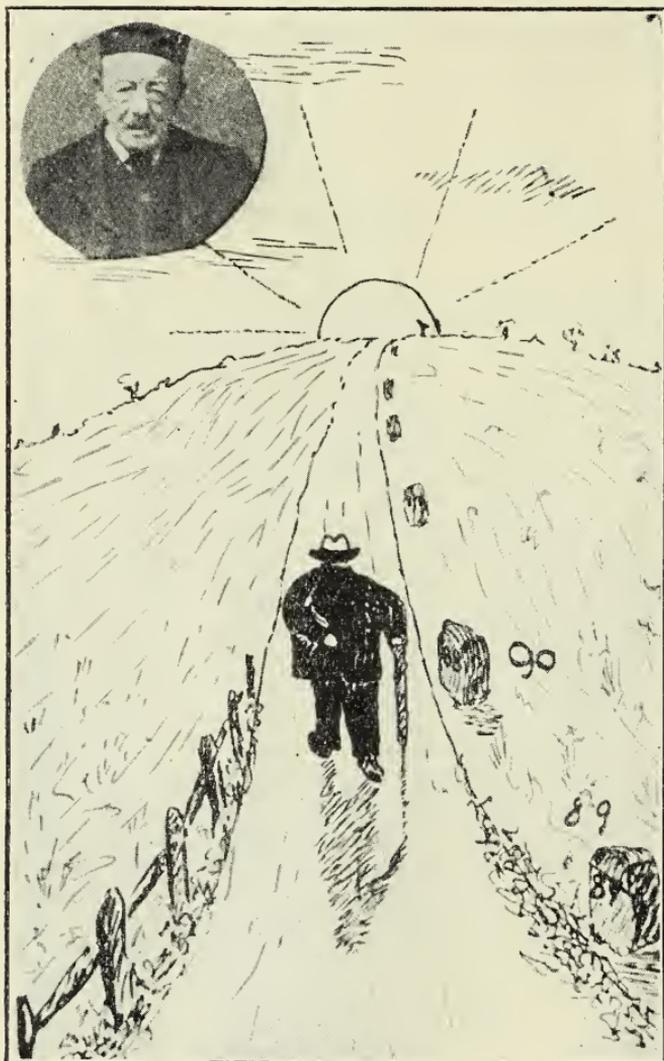
Messrs. G. P. Putnam's Sons, Ltd., of London and New York, have issued **Portraits in the London Zoo**, by **Silvia Baker** (112 pp., 15s. net). This consists of a series of well executed sketches, tinted, illustrating characteristic poses of the more important mammals in the Zoo, together with a few reptiles and birds. The large type, and the method of describing the animals, suggests that the book has been prepared for young readers.

The interest taken in **The Geology of the Country Around Stoke-on-Trent** has made the memoir dealing with that area in particular demand, and we are glad to see that a third edition has recently been published (H.M. Stationery Office, xvi. + 112 pp., 2/6). It is by **Dr. Walcot Gibson**, with contributions by **C. B. Wedd** and **A. Scott**, and is in explanation of Sheet No. 123, both solid and drift. We are pleased to say that the recent improvement in general appearance of these memoirs continues.

## In Memoriam.

ALFRED BELL, 1835-1925.

WE regret to record the death of Alfred Bell, F.G.S., at the advanced age of 90. All his life he has taken a keen interest in the more recent deposits, especially of East Anglia,



and during more recent years he was of considerable assistance to the late F. W. Harmer in connection with his researches in the Mollusca of the Post-Tertiary Deposits of this country. Evidence of Mr. Bell's work is given in the well-known monographs of the Palæontographical Society issued recently. He

was an indefatigable correspondent, with a gift of humour which made his letters welcome, and took great pleasure in supplying specimens to friends and museums likely to appreciate them. The present writer received many letters from him up to quite a short time before his death, his notes being frequently signed 'Tintinabulum' for brevity!

Last Christmas we received from him the card reproduced herewith. On the back was written :—

'And does the road wind up hill all the way?

Yes, to the very end.

And will the journey take the whole long day?

From morn till night, my friend.

I to the hills will lift my eyes.

Why should I cast them down?

When at the top there stands a Cross,

And at the Cross—a Crown.—ALFRED BELL.'

T. S.

—: o :—

### JOHN POSTLETHWAITE, F.G.S.

WE regret to record the death of J. Postlethwaite, F.G.S., whose book on the Geology of the Lake District is well known. He was author of 'Mines and Mining in the Lake District,' which is a very popular work. Among his other papers are 'Graptolites of the Skiddaw Slates,' 'Trilobites of the Skiddaw Slates,' 'Mineral Springs near Keswick,' 'The Deposit of Metallic and other Minerals surrounding the Skiddaw Granite,' and 'The Cleaved Ashes and Breccias of the Volcanic Series of Borrowdale. Prior to his retirement he was chief accountant with the Keswick and Penrith Railway, and in his youth an enthusiastic volunteer and an excellent shot. For some years he was honorary curator of the Keswick Museum. He died at Workington recently, at the age of 85.

—: o :—

Mr. T. A. J. Waddington, of York, has issued a valuable record of local dialect and manners in **T'Miners: Character Sketches of Yorkshire Lead Miners**, by **H. J. L. Bruff** (96 pp., 1/6). Mr. Bruff has always taken a special interest in the old lead miners, and is to be congratulated on his further contributions to an interesting subject.

Some of the personal friends of the late W. Whitaker, F.R.S., remember how assiduous and methodical he was in compiling bibliographies of papers relating to the Geology of the various counties of England, and in getting them printed in different societies' Transactions; and later, by the aid of these bibliographies, his preparation of Memoirs dealing with the Water Supply. The H.M. Stationery Office has just published **The Water Supply of Wiltshire from Underground Sources**, by **W. Whitaker** and **F. H. Edmunds**, as one of the *Memoirs of the Geological Survey of England and Wales* (v. +133 pp., 4/6 net). The Memoir is substantially bound in cloth-covered boards, and there are maps and sections of the area dealt with. The Memoir should, and will, be particularly valuable to those in Wiltshire interested in Water. The details of the numerous borings, etc., given will also be of great geological value.

## CORRESPONDENCE.

## LARVÆ OF GOAT MOTH ON HOP BINE.

Mr. E. W. Maule Cole writes to say that he has had larvæ of the Goat Moth (*Cossus liquiperda*) feeding in the stems of Hop Bine, and would like to know if any reader of *The Naturalist* has ever known or heard of any larvæ of the Goat Moth passing its initial stage in Bine stems.—E.P.B.

—: o :—

**Large Yorkshire Barbel.**—Some fine barbel of exceptional size for the county have recently been captured in the River Derwent, at Elvington. On July 12th, one weighing 8 lb. 6 oz. was obtained by Mr. J. Hobman, of York. On August 29th, one of 10 lb. 5½ oz. came to the creel of Mr. W. Barron, of York, while in the third week of July, Capt. Hyland, of Wakefield, accounted for three which weighed respectively 7 lb. 12 oz., 8 lb. 8 oz. and 9 lb. 4 oz. Another large fish weighing 9 lb. 12 oz. was caught by Mr. A. Taylor (Ashton-under-Lyne), in the Ouse, at Newton-on-Ouse, on August 23rd.—R. FORTUNE.

**Thrush killed by golf ball.**—On August 1st, a golfer on the North Cliff Course, at Scarborough, killed a Thrush in flight, when driving from the second tee.—R.F.

**Bitterns in Yorkshire.**—Mr. C. Scott-Hopkins records having seen a Bittern within five miles of Kirby Moorside, a little while ago. Previously (*The Field* for February 11th) he got a good view of it, as it was flushed among some rushes quite close to him. In the same number, Mr. W. E. Brigg writes that while shooting near Richmond, the beaters flushed a largish bird out of a gill on the moor edge, 'which we identified as a Common Bittern.' There was, however, no assurance that the bird was allowed to go away unharmed. We hope it did.—R.F.

**Accident to a Fallow Deer at Flamborough.**—At the end of July, 1925, a young fallow buck was found alive, but dreadfully injured, at the foot of the cliffs at Flamborough. Three of its legs were fractured, and one foot had been wrenched clean off. Despite its injuries, it struggled to get away from its finders, who mercifully put an end to its sufferings.—R.F.

**Preservation of Coarse Fish.**—The Yorkshire Fishery Board is considering proposals to prevent the slaughter of immature 'coarse fish' in the rivers Aire, Ouse, Derwent, Yore, Swale, Wharfe, Nidd and Hull. These bye-laws will make it illegal to take any fish less than the following sizes:—barbel, 12 inches; bream, chub and grayling, 9 inches; tench, dace, perch, roach and rudd, 7 inches. These measurements are surely small enough, and in the case of the last five species could with advantage be increased to 8 inches. It is also proposed to institute a rod licence of 1/- for 'coarse fish' anglers.—R.F.

## NEWS FROM THE MAGAZINES.

In *Nature*, No. 2929, Professor P. G. H. Boswell has some interesting notes on the Geology of the New Mersey Tunnel.

*The Animal World* for March contains an article on 'Some Superstitions about Animals,' by R. C. Bruce Gardner.

J. Strachan and T. H. Taylor write on 'The Potato Eelworm' in *The Journal of the Ministry of Agriculture* for January.

Sir George Fordham has some interesting notes on Saxton's General Map of England and Wales in *The Geographical Journal* for January.

In *The Quarterly Notes of the Belfast Museum*, Publication 87, Mr. Arthur Deane describes some bronze and early iron-age antiquities from Ulster.

*The Avicultural Magazine* for January appears with a new design on the cover, from a clever drawing by the late Herbert Astley, who was the President of the Avicultural Society.

A. W. W. Buckstone writes on the Migration of Insects, in *The Entomologist* for January; and in the February number E. G. R. Waters writes on 'Peronea cristana in the Oxford District.'

As a special supplement to *Nature* for January 16th is Prof. W. Garstang's Presidential Address to the Leeds Literary and Philosophical Society on 'Wordsworth's Interpretation of Nature.'

*The Ibis* for January contains 'Notes on the Courtship of the Black-tailed Godwit,' by J. S. Huxley and F. A. Montague, as well as 'Notes on the Quadrate as a Factor in Avian Classification,' by Percy R. Lowe.

Ray Palmer writes on 'The Drone Fly and its Larva, the Rat-tailed Maggot,' and Roland Garnett illustrates and describes some 'Freshwater Molluscs: Lamellibranchs, etc.' in *The Amateur Aquarist*, Vol. I., No. 10.

*The Entomologist's Monthly Magazine* for January includes a note on 'Bembidion redtenbacheri K. Daniel, a Coleopteron New to Britain,' by N. H. Joy. There is also a Portrait and Obituary Notice of Edward A. Butler.

W. M. C. Millar describes 'A Rat Migration' in *The Scottish Naturalist* for November-December, and J. H. Stenhouse records 'Jerdon's Reed-warbler at Fair Isle: an addition to the British Avifauna,' in the same publication.

An address by Prof. J. W. Cobb, of the Leeds University, on 'Coal Conservation and the Gas Industry' appears in *Nature* for January 9th; and in the same journal for January 16th, 'T. S.,' has an article on 'Regional Scientific Work.'

*The Journal of the Ministry of Agriculture* for December contains the following interesting notes, with many others: 'Downy Mildew of Mangold and Beet,' by Professor E. S. Salmon and W. M. Ware; and 'The Summer Pruning of Fruit Trees,' by H. Goude.

Among the contents of *Science Progress* for January, we notice:— 'The Recapitulation Theory,' by Prof. E. W. MacBride; 'Evolution in Spiders'; 'An Essay in Phylogeny,' by T. H. Savory; and 'The Importance of Mosquito Control,' by Sir Ronald Ross.

In his speech in connection with the centenary of the Norwich Museum, reported in *The Museums Journal* for December, the Lord Mayor of Norwich stated that the citizens are proud to be regarded as having the second best museum in the provinces. Now, which is the first?

*The New Phytologist*, published December 31st, is a particularly substantial part and contains, among others, the following papers: 'The Effect of Artificial Aeration of the Soil on *Impatiens balsamina* L.', by C. Hunter and E. M. Rich; 'Light and Growth,' by J. H. Priestley; 'On the Anatomy of *Orobancha hederæ* Duby, and its Attachment to the Host,' by P. Tate; 'A Note on the Relation of Rate and Growth to Structure in Plants,' by L. S. Penrose; 'On *Trachelomonas hispida* (Perty) Stein, and its Varieties,' by B. W. Skvortzow; and 'A Note on *Calamostachys tuberculata* Stbg.', by I. M. P. Browne.

## NORTHERN NEWS.

Our contributor, Dr. G. Claridge Druce, has been elected a corresponding member of the Société Botanique de Genève.

The National Museum of Wales is appealing for £100,000, in connection with which the Treasury has promised £1 for every £1 subscribed up to £35,000.

We understand that Dr. J. A. Clubb, of the Liverpool Museum, is about to retire. The Liverpool Museum has greatly improved during his directorship.

The Editors will be pleased to see newspaper or other reports of the Annual Meetings of the Societies affiliated with the Yorkshire Naturalists' Union, with a view to insertion in the pages of *The Naturalist*.

*Punch* tells us that 'Some sixteenth century mugs were found during excavations on the site of a newspaper office. They are thought to be observers of the early cuckoo, who called personally on the editor with the news and never returned.'

At the recent meeting of the Executive Committee of the Yorkshire Naturalists' Union, Messrs. F. H. Edmondson and H. B. Booth, were elected to represent the Union at the 6th International Ornithological Congress, to be held at Copenhagen in May.

For the British Association at Oxford, August 4th—11th, under the Presidency of the Prince of Wales, the Sectional President for Geology will be Prof. S. H. Reynolds; Zoology, Prof. J. Graham Kerr; Anthropology, Dr. J. H. Fleure; Education, Sir Thomas Holland, and Agriculture, Sir Daniel Hall.

The British Museum (Natural History) is doing much to popularise the collections under its charge, in the way of issuing coloured postcards in shilling sets. The latest deal with Ornamental Stones (two series); and there are also others referring to Exotic Butterflies, Exotic Moths, Exotic Beetles and Hymenoptera.

The late J. S. Cooke, of Ben Rhydding, formerly interested in the work of the Yorkshire Naturalists' Union, has left various interesting legacies. Mr. Cooke, along with other members of the family, was the means of providing a home for the Spen Valley Literary and Scientific Society, in the fine old residence known as Heald's Hall.

The Committee of the Walker Art Gallery, Liverpool, has recently received two gifts of £10,000 towards the £60,000 required for extension of the Walker Art Gallery. It seems that the Lord Mayor of Liverpool gave £1000, at the same time undertaking to match any other gift that might be made. Mr. G. Audley, of Southport, gave £10,000, whereupon the Lord Mayor increased his donation accordingly.

A beautiful collection of photographic pictures, slides and microscopical exhibits was a feature which claimed the interest of all who attended the annual meeting and exhibition of the Halifax Scientific Society recently. Mr. H. Waterworth (President) had charge of the business meeting. The Secretary's report was read by Miss E. H. Lumb. Membership at the end of 1924 was 223, and the present total was 194. Those who had died, Messrs. W. Wilkinson, J. Thomson, H. Ling Roth, H. A. Lumb, H. Mortimer and W. Holt, were mentioned sympathetically. The Society was grateful to the Misses Lumb for the gift of a reflecting telescope, and to Mr. J. A. Wade for an electrical equipment for the lantern. During the early part of the year Mr. F. Barker was elected an honorary life member, as a mark of esteem and in recognition of his work for the Society over a long period of years. The balance in hand at the commencement of the year, reported Mrs. Colledge (Treasurer), was £13 7s. 11½d. The Society's balance at present was £15 3s. 6½d. Mr. H. Waterworth (President), Mr. J. H. Lumb and Miss E. H. Lumb (Secretaries) and Mrs. Colledge (Treasurer) were re-elected. It was decided to give £3 3s. to the Leeds University Building Fund.

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**RILEY FORTUNE, F.Z.S.**

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Part LV. of Buckman's *Type Ammonites* contains descriptions and illustrations of *Schlotheimia redcarensis* from Robin Hood's Bay, *Ammonites gowerianus* (now known as *Galilacites curticornutus*), from the Kellaways Rock of Wiltshire, and several others. As showing the advantage of modern photographic methods of illustration, compared with the older method by means of drawings, giving what an artist *thought*

Fig. 1

Fig. 3a

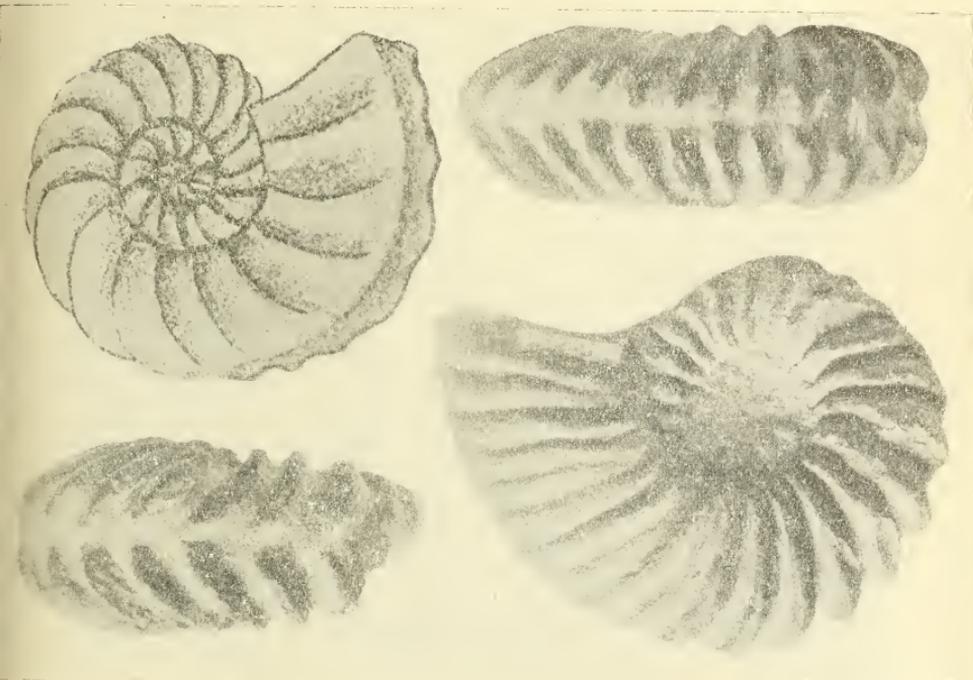


Fig. 3

Fig. 2

AMMONITES REDCARENSIS Young & Bird, 1822, Holotype?  
 Geol. Yorksh. 248, 327; XIV., 13. 'Robin Hood's Bay, Yorkshire,'  
 'Lowest Shale [Lower Lias]; Whitby Museum, 314'  
 S. 42.5, 40, 35, 30; 60, 42, 33, 32.5. Fig. 1, Protograph (copy),  
 Figs. 2, 3, sent as orig. of fig. 1. Qy., several orig. of fig. & descr. ?

SCHLOTHEIMIA REDCARENSIS, YOUNG & BIRD SP.  
 Schlotheimian, *marmorea*. See CCCXCV

he saw, the block herewith reproduced by the permission of Mr. Buckman is an excellent example.

In Part LVI. of the same work Mr. Buckman has much to say in reference to this species. He concludes: 'The types of Young and Bird's two editions came to the Whitby

Museum, so Martin Simpson, the Curator, was in the best position to know the specimens. He is quite positive that *Am. redcarensis* is a sulcate. The example now figured (T.A. DCVIII.) is presumably that which Simpson called "Young's original Redcar specimen." Simpson's measurements were often only approximate. If so, it will be best to accept the sulcate specimen and to call it the lectotype. Its locality would then be Redcar: Young and Bird seem to have been in the same confusion about the locality as about the specimen.'

#### CAYTONIALES AND MODERN FLOWERING PLANTS.

At a recent meeting of the Linnean Society, Dr. H. H. Thomas opened a discussion on the relation between the Caytoniales and modern Flowering Plants. The comparative study of the Flowering Plants having led to discordant conclusions as to their origin and early development, it is desirable to study all fossil plants which may provide evidence on these questions. The recently-described Caytoniales are of some interest because they were angiosperms without flowers, their reproductive structures being megasporophylls bearing carpels and microsporophylls bearing anthers. These sporophylls may have been borne on separate plants, and the grounds on which they are associated in one group seem reasonable though not finally conclusive. A single carpel and a single anther of this fossil type can be compared somewhat closely with the corresponding structures in the modern flower; they are much more comparable than any previously-described fossil forms, and they belong to a period (Middle Jurassic) in which the appearance of early angiosperms would be expected. It is unlikely that the Caytoniales represent the direct ancestors of the Flowering Plants, but they may be derived from the same stock which gave rise to that group; thus a study of their morphology may indicate those characters in the modern angiosperms which are to be regarded as primitive.

#### GRISTHORPIA AND CAYTONIA.

The structures described as carpels in *Gristhorpia* and *Caytonia* were certainly closed at an early stage, and had stigmas upon which pollen-grains are found. They were carpels in the physiological sense, though the use of this term has been criticised on morphological grounds. The author holds the view that De Candolle originally employed the term carpel for the closed ovary with style and stigma characteristic of the angiospermous flower, representing either a complete fertile leaf or a fertile leaflet, the petiole of which might be still recognisable. The later custom of regarding the term carpel as synonymous with megasporophyll and extending its

use to the gymnosperms is unjustifiable. The Caytoniales were probably widely distributed throughout the world in Mesozoic times. Species of *Sagenopteris* occur in both hemispheres, and range from Greenland to Grahamsland. The reproductive structures originally found in Yorkshire have now been detected in Greenland, and will probably turn up wherever the *Sagenopteris* leaves are abundant. These discoveries tend to show that the Angiosperms originated at a much earlier period than was formerly supposed, and that at least one group of early Angiosperms achieved a very wide distribution in early Mesozoic times.

#### VULCANOLOGICAL MUSEUM.

In a note on a Vulcanological Museum, H. P. T. Rohleder, writing to *The Irish Naturalists' Journal*, says: 'From a small local collection founded on right lines, if only the means financial and technical be forthcoming, there might develop a Museum of Vulcanology which, starting from its home in Antrim, would extend its operations over Ireland and the British Isles, and would ultimately take the whole of Europe, nay, the whole world for its province. Germany has already one such museum, that at Leipsic, founded by Prof. A. Shibel. Why should not the British Isles possess such a museum? And is there a more suitable place than Belfast for such an institution, the capital of a district which is celebrated as a region of magnificent vulcanicity far beyond the confines of the British Isles.'

#### THE HUNTING INSTINCT.

From an Editorial in a contemporary we learn that 'The hunting instinct is still with us, even in people who would vigorously repudiate any interest in sport. It is, I am assured by a psychologist, the hunting instinct which accounts for the public avidity for detective stories. It is rather probable that for once he is right. He has built a picture for me, for now I shall always see the double image of the prosperous looking stranger in the corner seat of a railway carriage reading a shocker in security—and back of him his ancestor getting an equal thrill out of tackling a mammoth with a bone-headed lance—but without equal security. It is a matter of personal preference, but one man is obviously better than the other.'

#### DRESSING ELEPHANTS' SKINS.

*The Museums Journal* for January contains the following note: 'Museum reports are generally tantalising; they tell us of some wonderful new method, but do not explain what it is; some novel scheme of arrangement is an enormous advance, but what the scheme may be we are left wondering. And now here is the Field Museum, of Chicago, informing

the readers of its Annual Report that "the African elephants were cleaned and their skins given such external treatment as seemed advisable to insure their further preservation in good condition." It would have been just as quick to say "were treated with Harlene, or Ronuk, or Sapolio, or Cuticura." But some day, no doubt, in its new series of technical publications the Field Museum will tell us what it actually did use.'

BRITISH LEPIDOPTERA.

The National Museum of Wales continues to issue its useful handbooks, the latest we have received being a Guide to the Collections of British Lepidoptera, which contains thirty-two pages and two excellently coloured plates, and is sold for the low price of sixpence. The Guide is intended to be of service to the student who cares to consult the 50,000 specimens in the National Museum of Wales, and there is a special chapter of historic specimens in the collections which will appeal to all entomologists. The plates are excellently done, and are from drawings by Miss O. F. Tassart.

ERYON (COLEIA) CF. ANTIQUUS.

In a paper on 'Fossil Macrurous Crustacea of England,' by Henry Woods\*, the following notes relating to Yorkshire specimens are given: 'Some specimens of a species of Coleia have been found in the Lias of the Yorkshire Coast. Two, from near Whitby, are in the York Museum, and one is in the British Museum. Another found in a nodule in the Boulder Clay at Waxholme, East Yorkshire, probably derived from the Lias of Yorkshire, has been described and figured by Mr. T. Sheppard. A portion of an abdomen was described and figured by J. F. Blake, and identified as *C. hartmanni* (Meyer), but this specimen cannot now be found. The chelipeds are not so long as in *C. antiquus*, and not so slender as in *C. hartmanni*. The specimen described by Sheppard shows the large eyes, the flagella of one of the antennules, the antennar scale, and the deep branchial notch. The cervical and branchial grooves remain distinct from one another. The posterior part of the lateral margin of the carapace is seen and bears spines. The dorsal and lateral carinae are present, but do not appear to have been prominent. A median carina is present on the abdominal terga. In the exopodites of the uropods the suture is distinct. This species resembles closely a specimen from the Upper Lias of La Caine which was sent to the late James Carter as an example of *Coleia edwardsi* (Moriere), but from the figure of that species it does not seem possible to be sure of the correctness of that identification.' In the same monograph Mr. Woods figures and describes *Astacodes falcifer* from the Speeton Clay.

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\* *Pal. Soc. Monograph*, Vol. LXXVII.

## MANX MUSEUM JOURNAL.

*The Journal of the Manx Museum* for March contains particulars of a large Fishing Frog or Sea-Devil (*Lophius piscatorius*), the Shag, and other specimens recently added to the museum. From an old manuscript, which is quoted, the following interesting information is given relating to the year 1601: 'The prices current for commodities at that time can be gauged from a list of "provisions bought of the Lord his price as followeth." Sheep cost sixpence each, lambs one penny, geese one penny, hens three a penny; barley eightpence a bowl, oats twopence a bowl, and wheat a shilling a bowl. A mill horse cost one shilling; the soap used throughout the Castle for a whole year amounted to one shilling, and that for the Deputy Governor's use also one shilling.'

## HIGH LIFE AT HORNSEA.

We learn from the press that 'It is many a year since such a large quantity of seaweed was seen within such a short distance on the sands. It is estimated that there are hundreds of loads between new road end and the stream dyke, and it is surprising farmers and small holders have not made inroads into it. On Monday, February 22nd, a shark, 8 feet long, was washed ashore not far from the new road end, and it had probably been dead some time. It was buried on Tuesday. A smaller one has been seen in the neighbourhood of Barmston during the week-end.' The paragraph is headed 'Hornsea Life.'

## SQUIRRELS.

We have received from Mr. Hugh Boyd Watt a copy of his 'Observations on the American Grey Squirrel in Britain,' reprinted from *School Nature Study* for January. We quote the following extract:—'A gamekeeper reports that in 1921 he examined the stomachs of 100 grey squirrels trapped by him in the York district and found the contents to be entirely vegetation. He had suspected them of taking eggs and perhaps game, but this was not verified. Unfortunately for the reputation of the grey squirrel its tastes coincide in many respects with those of man. Oats are carried off by them from the stooks, and gardens are raided, green stone fruit being taken for the kernels; plums, peaches, apricots, apples pears, strawberries and gooseberries are all taken, and rows of peas are cleared off. They have been known to dig up crocus bulbs. The enmity of the gardener is thus assured, and the forester has an even more heinous bill of charges against the squirrel. The bark is peeled off young trees and buds and young shoots, and the leaders and upper laterals of many kinds of deciduous trees are destroyed. It apparently does not find conifers so much to its liking as our native

squirrel does, whose condemnation is on the lips of every forester and arboriculturist and whose destruction is vigorously pursued, particularly in the afforested districts of the North. The Highland Squirrel Club, since it was started in 1903, has accounted for the destruction of about 70,000 of the native red or brown squirrel in Inverness-shire and Ross-shire, and it is stated that, on the Strathspey estate, 3,700 of this species were killed in the year 1922.'

#### HOUSES OF PARLIAMENT.

After the extraordinarily elaborate precautions taken before the Houses of Parliament were built, when, in view of the peculiar atmosphere of London, even William Smith, the Father of English Geology, was consulted with regard to the most suitable stone, it is somewhat surprising to read the remarks of Sir Frank Baines, the Director of Works, the architect who for many years has had charge of the structure of the Houses of Parliament, as reported in *The Quarry* for February. He states:—'There was no structural instability, but the elaborate ornamentation of the cupolas, pinnacles, turrets, cuspings, and panels was in a very dangerous condition, and the safety of members of the public could not be guaranteed. The whole building was in a state of extreme mutilation. The decay was due to the use of unsuitable stone and to unnecessary elaboration of detail. It began to be apparent within ten years after the commencement of the superstructure in 1840, and the present condition was inevitable with the atmosphere of London acting on a stone which had inherent faults, both chemical and structural. The cost of repairs was bound to be very large. The cost of such a building nowadays would be £12,000,000 or £13,000,000 sterling. If he put the cost of the necessary repairs and restorations at 8 per cent. of that, spread over the 12 to 15 years it would take to execute them, which would work out at about  $\frac{1}{2}$  of 1 per cent. per annum, he thought that would be an approximately correct prophecy, but it could only be that. Up to date no less than 40 tons of stone have been picked off the building by hand, and more than 400 tons have been removed by other means.'

#### CUM GRANO SALIS.

We learn from the press that recently 'the origin of rock salt, a matter of frequent conjecture among geologists, was discussed by Mr. Charles E. Newton, in a paper read before the Manchester Geological and Mining Society. Mr. Newton advanced the theory that the presence of salt both in the sea and the salt beds was due to a cosmic catastrophe, the near approach to possibly the collision of the world with a sun, when contact with iron, sodium, and helium vapours caused a deposit of salts (which the lecturer calculated at 100 yards thick) over the whole of the earth's crust.'

## THE NEGATIVE PHOTOTROPIC CURVATURE OF THE ROOT.

J. H. PRIESTLEY.

(*A postscript to the Presidential Address.*)

WHEN discussing, at Huddersfield, on December 5th, the problem of the negative phototropic curvature of certain roots, the writer had not been able to obtain a copy of a paper by Blaauw (1), in which an experimental investigation of this problem was described. A copy of this paper has since been received from Professor Blaauw, and it would seem desirable to complete the account of phototropism contained in the Presidential Address by a brief description of Blaauw's experimental results and some discussion of the conclusion he draws from them.

Most roots experimented with (*Raphanus*, *Avena*, *Lepidium*) prove quite insensitive to lateral illumination, and show no phototropic curvatures, and these roots, when transferred from darkness to uniform illumination, show no alteration in growth rate. One root, however, that of *Sinapis alba*, although insensitive to brief exposures to light of very high intensity, if placed for a long time in light strengths of some 60 metre candles upwards, shows in uniform illumination a definite retardation in rate of growth after about half an hour, and in lateral illumination of the same strength a negative phototropic curvature is visible in about three-quarters of an hour.

There is here the same contradiction as was observed in *Phycomyces*, the side towards the light should presumably receive most light, and as a result grow more slowly, and yet curvature is away from the light, so that the side away from the light is growing more slowly. Blaauw attempts an interpretation on the same lines as he advanced for *Phycomyces*. He points out that the curvature takes place, not at the region where the root is extending in length most rapidly, but at a region nearer the apex. This region, in the transparent seedling root of *Sinapis*, has a somewhat different density to the rest of the root, and he shows a photograph of the root taken at right angles to the lateral light incident upon it, which suggests that in this region the light may be concentrated upon the side of the root furthest from the light as a result of its refraction in the tissues. The experimental evidence for this accumulation of the light on the further side is not, however, very convincing. In this case, a tissue is in question and not a single transparent hypha, and the scattering of light due to the multitude of structural features with

different refractive properties, is likely to wipe out completely any difference in light intensity due to the general refractive properties of the tissue as a mass.

Furthermore, if lens-like action by the cylindrical tissue mass as a whole is concerned it is surprising that the phototropic curvature is equally pronounced whether the root is growing in air, refractive index 1.0003, or water, with refractive index 1.33. Blaauw brings forward in experimental support the observation that the root fails to show phototropic curvature if laterally illuminated when immersed in paraffin oil (refractive index 1.46). As, however, the amount of growth appears to have been very small, the experimental difficulties in the way of obtaining normal growth responses in such a medium seem a sufficient explanation of the experimental result.

Blaauw's explanation would obviously also fail to interpret the similar negative phototropic curvature of the relatively massive aerial roots of such a plant as *Chlorophytum*, roots which show well-marked negative curvatures when laterally illuminated, whether grown in air or water.

Any alternative explanation must reconcile the following facts. Illumination produces a retardation of growth; the curvature is strictly localised to the growing region just behind the meristematic apex; curvature and growth retardation are both produced slowly on long exposure to light, so that the light quantities involved are of a different order of magnitude from those concerned with the phototropic curvature of the etiolated shoot. These facts emerge from Blaauw's experiments. In addition, anatomical study of a phototropic curvature makes it clear that the curvature is the result of the greater elongation of the cortical cells on the convex side of the bend.

This last fact lends support to the suggestion (*The Naturalist*, March, p. 77) that the curvature may be due to a greater extension of the cells on the side of the root towards the light as a result of the photochemical action of the light upon the cell wall. This experimental result would then come somewhat into line with the experiments upon *Phycomyces*, with the proviso that much larger light quantities were involved, and the difference in cell extension only occurred when the light fell upon cells just passing from the meristematic into the vacuolated condition. This interpretation, however, has still to be reconciled with the fact that the greater extension of the cells on the side towards the light is accompanied with a retardation of the rate of extension of the root as a whole as the result of uniform lighting. Such reconciliation is not impossible, but should not be attempted until a wider field of experimental facts can be reviewed. It is hoped to return to

this problem in connection with a general discussion of the effect of light upon plant growth which is at present appearing in another journal (2).

## REFERENCES.

1. BLAAUW, A. H. ... 'Licht und Wachstum,' III. Die Erklärung des Phototropismus. Mededeelingen van de Landbouwhoogeschool. *Lab. voor Plantenphysiologie*, No. 1. Wageningen, 1918.
2. PRIESTLEY, J. H. ... 'Light and Growth.' *New Phytologist*, 1925 and 1926.

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## NEW BOTANICAL BOOKS.

**British Woodlands as illustrated by Lessness Abbey Woods**, by **St. John Mariott**. London: Routledge & Son, 1925, xviii.+81 pp., with folding map, 2/6. This excellent survey of a woodland in Kent is the outcome of a co-operative effort by members of the Woolwich Historical and Scientific Society, and as a supplement to the 'Woolwich Surveys.' Commencing with an interesting historical preface, there follows a brief account of the geology, scenic features, and rainfall. In a detailed botanical survey of the area six selected plant communities in the oakwood association are illustrated by charts, and there is a brief account of the oak-birch-heath association. The rest of the work is devoted to lists of species of flowering plants, mosses, liverworts, fungi, lichens, and mycetozoa. The fauna was also studied, and lists are given of the mammals, birds, reptiles, amphibians, fishes, galls, lepidoptera, mollusca, and the fossils of the Blackheath shell beds. There are five photographs and a large folding plan showing the distribution of the chief plant societies.

**Plants and Man**, by **F. O. Bower, Sc.D., F.R.S.** London: Macmillan, 1925, xii.+365 pp., 14/- net. To those familiar with Prof. Bower's popular writings this work will come as a further welcome contribution. Originally appearing as essays in the *Glasgow Herald*, they have been reprinted, and are now well illustrated by many, if familiar, figures. The book opens with an interesting survey of the structure and functions of the plant body, and then follow studies of such plant communities as pasture, woodland, moor, mountain and sea shore, showing the striking adaptations to the varied conditions of the different habitats. Plants in cultivation are then considered to show their significance and importance; and the mechanical construction of plants is followed by chapters on timber, textiles and twine. Plant population and conjoint life, with crowding and overlapping, leads on to parasitism, mycorrhiza, the fungal habit, bacteria, scavenging and sanitation. The work concludes with two very entertaining and thoughtful chapters on man's dependence and influence on vegetation.

**A Textbook of General Botany**, by **R. H. Holman and W. W. Robins**. London: Chapman & Hall, 1924, vii.+590 pp., 12/6 net. This volume, by two Californian botanists, embodies the substance of the lectures on general botany in that University, and covers the ground required by the general student as well as for those entering agriculture. This makes an interesting combination which many students here will find useful. The point aimed at is that the general student will profit by the application to agricultural practices and problems, and the agricultural student will benefit by a broad survey of the subject. Throughout function is related to structure, and the field

covered is kept within such limits as to ensure thoroughness. The authors suggest that if 'lectures were devoted to fundamentals, the instructor would be able to devote more of his time to the more effective work of recitation, conference and quiz.' The two parts of the book are devoted (1) to the morphology, histology, and physiology of the flowering plant, and (2) to an account of the life-histories of typical algæ, fungi, mosses, ferns, and seed plants, concluding with a chapter on evolution and heredity. The illustrations are numerous, bold and clear.

**Monocotyledons: A Morphological Study**, by Agnes Arber, M.A., D.Sc. Cambridge Press, pp. xiv. + 258, 25/- net. This work is appropriately dedicated to the memory of Ethel Sargent, who made such valuable contributions to our knowledge of the anatomy of monocotyledons, and gathered round her an active band of workers. This work was to have been undertaken by Miss Sargent, but she was not spared to complete the task. It was, therefore, taken in hand by her pupil and colleague, Mrs. Arber, who has not only given us an exhaustive summary of the results of previous work on the group, but has included extensive contributions of her own. After an introduction on the principles of morphology, the several organs of the plant are dealt with in turn, viz., root, axis, foliage-leaf, prophyll, seedling and its significance, the reproductive phase, taxonomy and its interpretation, parallelism in evolution, and a bibliography of works referred to in the text. Many interesting illustrations are given of vegetative reproduction, growth-rhythm, and periodicity. Mrs. Arber has succeeded in incorporating the important results of the past, and discusses at length the debateable problems raised by recent work on the endodermis, the leaf-skin theory, the nature of the carpel and the origin of the pistil. The cotyledon naturally receives much attention, and the view is expressed that we need not look upon the cotyledon as a dual organ, but rather that the growth-rhythm produces a single leaf at the first node, favoured by the marked tendency in the group for the leaf bases completely to ensheath the axis, which precludes the production of two leaves at the node. 'There is no logical necessity for two cotyledons, and the prolonged search for the missing leaf is because botanists have been hypnotised by their own terminology.' The phyllode theory, as was to be expected, receives full treatment, and in the chapter on prophylls the view is adopted that the so-called phylloclades are leaves, that the axis is insignificant, while the leaves are relatively important, and in the *Rusceæ* the activity of the axillary bud may be confined to the production of a single leaf, the prophyll. The book is well printed and the illustrations are numerous and clear.—T.W.W.

**Indian Bird Life**, by Douglas Dewar. London: John Lane, The Bodley Head, xv. + 276 pp., 7/6 net. Douglas Dewar's work on Indian Bird Life has previously been referred to in these columns. The present volume deals more with the question of the struggle for existence of the birds of India, and the chapters are on such questions as The Destruction of Eggs and Nestlings; The Competition for Nesting Sites; Unmated Birds; Nest Desertion; Food Supply; Instinct at Fault; Destructive Agencies (Enemies, Disease, Accidents, Forces of Nature). In addition to this he deals with Successful Species and Vanishing Species.

**Egyptian Birds**, by F. H. Brooksbank. London: Macmillan & Co., vii. + 120 pp., 2/- net. Under the above title the author describes the Owl, Hawk, Kestrel, Peregrine Falcon, Kite, Crow, Kingfisher, Wild Duck, Gull, Swallows and Martins, Warbler and Wagtail, Ibis, Plover, Hoopoe, Flamingo, Pelican, Heron, Stork, Crane, Sparrow, and has notes on Migration. Oddly enough the Bat is also described, although the author admits it should not be included in a book on birds. There are illustrations of the principal species.

## ADDITIONS TO THE FLORA OF CHESHIRE.

N. WOODHEAD, B.Sc.

SINCE the publication of the 'Flora of Cheshire,' in 1899, there have been many fresh records for the county, and our knowledge of the Nantwich Hundred (Hundred 6 of the Flora) has been increased. One of the most interesting local lists, which has provided the present author with numerous notes on the vegetation, was drawn up by the Rev. T. W. Norwood, for the Parish of Wrenbury, of which he was Vicar from 1878 to 1907. His notes have not been published completely, but I am indebted to the present Vicar of Wrenbury, Rev. J. Webster, for permission to use them. Mr. Webster has himself made a study of the flora of this portion of Cheshire. Mr. Norwood's list was made in a copy of the fourth edition of Hooker's Flora (1838). Every species that he met with in his parish was definitely marked, while the distribution of the more uncommon plants was more fully treated. In several instances Mr. Norwood traced the introduction of new species.

For many of the Marbury plants I have had access to a schedule of plants drawn up by Mr. Wood, who has been Headmaster of the Marbury Schools for many years. This list was compiled for the students at his school, and contains notable additions to the stations in the county flora, although Marbury is well represented in that work. In many cases the Wrenbury and Marbury lists supplement and confirm each other, and in this way a fair conception of the plants of South Cheshire has been attained.

Other workers in the district around Nantwich have made interesting observations, and I am grateful to Capt. J. O. R. Phillips, B.Sc., Dr. W. F. Bewley, Mr. S. Williams, M.Sc., Mr. W. Leach, M.Sc., Mr. Mills, B.Sc., and others for confirmation of my personal records. In the list which follows, the localities are given for each species named; most of the Wrenbury plants were taken from Mr. Norwood's list and the Marbury plants from Mr. Wood's list; a good proportion of these have been verified by myself and others.

A few corrections have also been mentioned, principally where species have completely disappeared from the localities assigned to them in the county flora. No species of the families Boraginaceæ and Plantaginaceæ were recorded in 'The Flora of Cheshire' for the Nantwich Hundred:

It is possible that the Gymnospermæ found in this portion of the county have been planted, with the exception, perhaps, of *Taxus baccata* L. *Pinus* forms definite ecological associations with *Larix* and *Picea* on some of the drained mosses.

- Anemone nemorosa* L. Austerson, Dorfold, etc.  
*Ranunculus auricomus* L. Wrenbury.  
*R. parviflorus* L. Wrenbury.  
*R. arvensis* L. Marbury.  
*R. Ficaria* L. Nantwich, Sound, Wrenbury, Wybunbury.  
*R. heterophyllus* Web. Hunsterson.  
*R. trichophyllus* var. *Drouetii* Sch. Marbury. Had been recorded for the nearby village of Bickerton in Broxton Hundred.  
*R. hederaceus* var. *omniophyllus* Ten. Ridley's Pool.  
*Nymphæa lutea* L. Wrenbury, Marbury.  
*Papaver Rhæas* L. Wybunbury.  
*P. Argemone* L. Wybunbury.  
*Fumaria capreolata* L. Wrenbury, Marbury. A new county record.  
*F. muralis* var. *Boræi* Jord. Has not been traced in Willaston as recorded in the Flora.  
*Radicula sylvestris* Druce. 'Banks of River Weaver opposite the grounds of Shrewbridge House, 1874.' This seems to have disappeared.  
*Cardamine amara* L. Is no longer to be found on the Mill Eye at Nantwich.  
*Erophila verna* Mey. Wrenbury, Marbury.  
*Sisymbrium Thaliana* L. Weston, Wrenbury.  
*Brassica campestris* var. *Napus* L. Wrenbury.  
*B. campestris* var. *Rapa* L. Nantwich, Marbury.  
*Coronopus procumbens* Gilib. Marbury. 'A curious absentee from inland Cheshire' (Flora).  
*Lepidium Draba* L. Shavington, Marbury.  
*Teesdalea nudicaulis* Br. Sound Common (recorded by Webster and Wood). In the Flora, Nantwich is the only Hundred without a locality.  
*Reseda Luteola* L. Wybunbury, Wrenbury, Marbury. In the Flora this species is also stated to grow on the Barony at Nantwich, but Lord de Tabley doubted its nativity there. With these additions it would appear to be quite native as in other parts of the county.  
*Viola canina* L. Sound.  
*V. tricolor* L. Wrenbury.  
*Polygala vulgaris* L. Sound and Wybunbury.  
*Hypericum perforatum* var. *angustifolium* Gaud. Wrenbury.  
*Linum angustifolium* Huds. Wrenbury and Marbury.  
*Geranium phæum* L. Wrenbury.  
*G. lucidum* L. may be added, as it is a troublesome weed in some places.  
*Impatiens Noli-tangere* L. Combermere.  
*I. biflora* Walt. Wrenbury, Marbury, but not native.  
*Rhamnus catharticus* L. Wrenbury.  
*Saponaria officinalis* L. Marbury.  
*Silene inflata* Sm. Wrenbury, Marbury.  
*Cerastium erectum* C. and G. Wrenbury.  
*C. semidecandrum* L. Wrenbury. Also Beeston Castle in Broxton Hundred.  
*Sagina nodosa* Fenzl. Wrenbury.  
*Claytonia perfoliata* Donn. Specimens often sent for identification. Aston.  
*Genista tinctoria* L. Wybunbury, Wrenbury, Marbury.  
*Melilotus officinalis* Lam. Marbury.  
*M. alba* Desr. Observed on ballast at Wrenbury.  
*Lotus uliginosus* Schk. Wrenbury, Marbury.  
*Vicia sylvatica* L. Marbury.  
*Lathyrus pratensis* L. Austerson.  
*Prunus insititia* L. Wrenbury.  
*P. spinosa* v. *macrocarpa* Wal. Audlem.

- Spiræa salicifolia* L. Newhall.  
*Rubus carpiniifolius* Wh. & N. Wrenbury.  
*R. corylifolius* Sm. Wrenbury.  
*Agrimonia Eupatoria* v. *odorata* Mill. Marbury.  
*Poterium officinalis* A. Gray. Marbury.  
*Rosa villosa* L. Wrenbury.  
*Saxifraga tridactylites* L. On an old wall at Wrenbury Hall.  
*Parnassia palustris* L. Austerson. (See 'Journal of Botany,' June, 1925.)  
*Ribes Grossularia*. Wrenbury.  
*R. nigrum* L. Marley Moss.  
*Sedum acre* L. Wrenbury, Marbury.  
*S. Telephium* L. Marbury. The variety *purpurescens* Koch. was still growing opposite the Delves School, Wybunbury, in 1923, the locality mentioned in the Flora.  
*Sempervivum tectorum* L.  
*Myriophyllum alternifolium* D.C. The Flora gives this plant as growing in 'a pit near Crewe Station' under the heading of the Broxton Hundred. The hamlet of Crewe in this Hundred has no station near it, so it must be assumed that Crewe in the Nantwich Hundred was meant.  
*Callitriche palustris* L. Marbury.  
*C. polymorpha* Lönn. Doddington.  
*Epilobium roseum* Schreb. Wybunbury.  
*Sanicula europæa* L. Austerson, etc.  
*Conium maculatum* L. Wrenbury, Marbury.  
*Apium inundatum* Rf. Wrenbury, Marbury.  
*Carum Petroselinum* B. and H. Marbury.  
*Eranthe crocata* L. Marbury.  
*Æthusa Cynapium* L. Willaston (Racklyeft), Wrenbury.  
*Viburnum Lantana* L. Wrenbury.  
*Adoxa Moschatellina* L. Austerton, Wrenbury, Marbury.  
*Valeriana officinalis* L. Wrenbury, Marbury.  
*Valerianella olitoria* Poll. Wrenbury, Marbury.  
*V. dentata* Poll. Walgherton.  
*Dipsacus fullonum* L. This species seems to be becoming established on a railway embankment, where it probably originated from seed scattered amongst ballast. The plants have been under the observation of Mr. Knight for three years.  
*Filago germanica* L. Wrenbury.  
*F. minima* L. Wrenbury.  
*Anthemis arvensis* L. Wrenbury.  
*A. Cotula* L. Henhull.  
*Chrysanthemum segetum* L. Wrenbury, Marbury.  
*Petasites ovatus* Hill. Stapeley, Wrenbury, Marbury.  
*Doronicum Pardalianches* L. Wrenbury.  
*Senecio viscosus* L. Sound and Aston.  
*Arctium Lappa* L. Austerson, Wrenbury, etc.  
*Carduus crispus* L. Wrenbury.  
*C. tenuiflorus* Curt. Wybunbury Moss.  
*Cirsium pratense* Druce. Marley Moss.  
*Centaurea Cyanus* L. Wrenbury, Marbury.  
*Cichorium Intybus* L. Wrenbury.  
*Arnoseris minima* S. and K. Marbury.  
*Picris Hieracioides* (Moench). Marbury.  
*Crepis paludosa* Moench. Marley Moss.  
*Lactuca virosa* L. Wrenbury (?)  
*Campanula Trachelium* L. Marbury (?)  
*Hottonia palustris* L. Ponds near Wrenbury Hall, and elsewhere.  
*Primula elatior* Schreb. Wrenbury.

- Primula vulgaris* Huds. Has a curious distribution in the Hundred, as it is entirely absent for a distance of several miles on one bank of the River Weaver, but occurs in abundance elsewhere.
- P. veris* L. Church Minshull, Austerson, etc. Often found in similar localities as *P. vulgaris*, but not as common.
- Lysimachia vulgaris* L. Newhall, Marbury.
- L. Nummularia* L. Canal banks at Marbury.
- Anagallis arvensis* L. Acton, Wrenbury, Marbury.
- Vinca minor* L. Audlem, Marbury, Wrenbury Frith.
- Menyanthes trifoliata* Huds. Doddington, Wrenbury, Marbury.
- Symphytum officinale* L. Hankelow, Wrenbury, Marbury.
- Anchusa sempervirens* L. Wrenbury.
- Lycopsis arvensis* L. Wrenbury, Marbury.
- Myosotis palustris* Hill. Hough, Wrenbury.
- M. palustris* v. *repens* Don. Wrenbury, Marbury.
- M. cæspitosa* Schultz. Wrenbury.
- M. sylvatica* Hoffm. Distributed evenly over the Hundred from Church Minshull to Shavington Park.
- M. scorpioides* L. Cholmondeston, Wrenbury, Marbury.
- M. collina* Hoffm. Marbury.
- M. versicolor* Sm. General distribution over the Hundred.
- Cuscuta trifolii* Bab. Was found at Wrenbury by Miss Starkey in 1896.
- Solanum nigrum* L. Norbury Common.
- Datura Stramonium* L. The Barony, Nantwich, where it has established itself from the waste thrown from gardens. Seeds are occasionally found amongst garden seed.
- Hyoscyamus niger* L. Introduced into Wrenbury village during Mr. Norwood's incumbency, and it extended after cultivation during the War.
- Linaria Cymbalaria* Mill. Mill race wall, Nantwich, Sound, Marbury.
- Veronica officinalis* L. Wrenbury, Marbury.
- V. montana* L. Combermere, Marbury.
- V. Tournefortii* Gmel. Wrenbury, Marbury.
- V. agrestis* L. Wrenbury, Marbury.
- V. hederifolia* L. Wrenbury, Marbury.
- Pedicularis palustris* L. Sound, Marbury.
- Utricularia vulgaris* L. In the introduction to the 'Flora of Cheshire' this species was stated to grow at Combermere, but in the actual Flora it was omitted. From Mr. Norwood's list I find that *U. vulgaris* was introduced into Combermere in 1887.
- Origanum vulgare* L. Reaseheath, Marbury; garden escapes (?)
- Scutellaria minor* Huds. Wrenbury.
- Marrubium vulgare* L. Wrenbury.
- Stachys sylvatica* v. *ambigua* Sm. Wrenbury.
- Galeopsis Ladanum* L. Henhull.
- Lamium hybridum* Vill. Wrenbury, Marbury.
- L. amplexicaule* L. Wrenbury.
- L. Galeobdolon* Cr. Edleston, Wrenbury, Marbury.
- Plantago lanceolata* L. Common in pastures.
- P. media* L. Wrenbury, Marbury.
- P. major* L. Common in pastures.
- Chenopodium urbicum* L. As a weed of cultivation, Marbury.
- C. urbicum* v. *intermedium* Moq. Wrenbury.
- Atriplex hortensis* L. Reaseheath.
- A. patula* v. *angustifolia* Sm. Wrenbury.
- Polygonum amphibium* v. *terrestre* Leers. Acton and the Hough, Wrenbury.
- Fagopyrum sagittatum* Gil. Mentioned first for Nantwich by Gerarde in 1633, has completely disappeared, although it was once widely cultivated.

*Rumex acutus* L. Wrenbury.  
*Asarum europæum* L. Wybunbury Parsonage (T. W. Norwood).  
*Viscum album* L. On old standard apple trees at Audlem and elsewhere.  
*Euphorbia exigua* L. Marbury.  
*E. Lathyrus* L. Wrenbury.  
*Ulmus glabra* Mill. Newhall.  
*Parietaria ramiflora* Moench. By the canal at Marbury.  
*Myrica Gale* L. Wybunbury Bog and Moss, Marbury.  
*Carpinus Betulus* L. Nantwich, Acton.  
*Quercus sessilis* Ehrh. The Hough.  
*Castanea sativa* Mill. Doddington, Wrenbury.  
*Salix aquatica* Sm. Wrenbury.  
*Populus alba* L. Worleston, Wrenbury.  
*P. nigra* L. Dorfold, etc., Wrenbury. The variety '*italica* Moench' is extensively planted.

*Elodea canadensis* Michx. River Weaver, by the mill in Nantwich.  
*Orchis Morio* L. Austerson, Wrenbury, Marbury.  
*O. mascula* L. Wrenbury and Marbury.  
*Habenaria viridis* Br. Combermere and Osmere.  
*H. virescens* Druce. Osmere (1909); Quoislely (1910).  
*Iris foetidissima* L. Marbury.  
*Polygonatum multiflorum* All. Norbury Common.  
*Allium ursinum* L. Wrenbury, Marbury.  
*Paris quadrifolia* L. Marbury.  
*Alisma Plantago-aquaticum* v. *lanceolatum* With. Canal at Henhull.  
*Potamogeton perfoliatus* L. Wrenbury.  
*P. densus* L. Wrenbury.  
*Carex hirta* L. Wrenbury.  
*C. sylvatica* Huds. Wrenbury.  
*C. caryophyllacea* Lat. Wrenbury.  
*C. elata* All. Marbury.  
*Carex gracilis* Curt. Wrenbury.  
*C. muricata* L. Wrenbury.  
*Alopecurus geniculatus* v. *aqualis* Sobol. Wrenbury.  
*Milium effusum* L. Marbury.  
*Agrostis canina* L. Wrenbury, Marbury, etc.  
*Calamagrostis epigeios* Roth. Wrenbury.  
*Deschampsia flexuosa* Beauv. Sound Common, Marbury.  
*Holcus mollis* L. General in distribution.  
*Catabrosa aquatica* Beauv. Wrenbury, Marbury.  
*Melica uniflora* Retz. Wrenbury, Marbury.  
*Poa nemoralis* L. Wrenbury.  
*P. compressa* L. Marbury.  
*Festuca duriuscula* Syme. Wrenbury.  
*F. arundinacea* Schreb. Marbury.  
*F. ovina* L. Sound, The Hough, Marbury.  
*F. Myuros* L. Wrenbury.  
*Lolium temulentum* L. Wrenbury, Marbury.  
*L. italicum* A. Br. Met with as a stray.  
*Agropyrum caninum* Beauv. Wrenbury.  
*Nardus stricta* L. Norbury Common, Wrenbury.  
*Taxus baccata* L. Reaseheath, Acton.  
*Pinus sylvestris* L. Occasionally large Scots Pines are found in hedges as at Reaseheath Hall.

*Equisetum sylvaticum* L. Sound.  
*E. limosum* v. *fluviatile* L. Wrenbury.

*Botrychium Lunaria* Sw. Hurleston, Osmere, Wrenbury.

*Ophioglossum vulgatum* L. In similar localities.

*Osmunda regalis* L. In a remote fox-covert.

*Pilularia globulifera* L. Does not now remain on Beam Heath as recorded in the Flora.

*Isætes lacustris* L. Was stated to grow at Wrenbury, but it is very unlikely that it still remains in that parish.

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**Great Catch of Perch in the Cumberland Lakes.**—In three days' fishing, August 1st, 4th and 5th, Captain Norton, of Bournemouth, caught 740 perch. His bags for each day numbered 242, 66 and 432.—R. FORTUNE.

**Partridges and Pullets.**—Barren Partridges will, when possible, annex the young or eggs of other birds. Last year a pair, at Hawes, took over some eggs laid astray by a White Leghorn pullet and successfully brought out the chicks.—R.F.

**Skate Leech in the Irish Sea.**—During the months of August and September, while I was engaged in fishery investigations in the Irish Sea, I saw this species taken five times by trawlers and prawn-boats fishing from the Isle of Man and Fleetwood respectively. In all cases the parasite was attached to the ventral surface of the Skate.—V. C. WYNNE-EDWARDS, New College, Oxford, 3rd January, 1926.

**Distribution of Land-snails among Medicinal Herbs.**—Recently I received several living *Xerophila virgata*, a single *X.* sp. (cf. *profuga*), and *Hygromia cinctella*. They had been found among juniper berry imported from Northern Italy by the Frederiksberg Apoteke in Copenhagen. The species, of course, are quite common in western Mediterranean countries, but their occurrence alive among chemists' drugs indicates one way in which the species may be distributed from one country to another.—HANS SCHLESCH, Copenhagen.

**Cumberland Hepaticæ.**—The following records of Hepaticæ are all additional localities to the county list:—*Marchantia polymorpha*, Kelsick, near Wigton; *Metzgeria furcata* on bark of Ash tree, Caldbeck, Nether Wastdale; *M. conjugata* on rocks at Lodore; *Lophozia Floerkii* on ground on Penrith Beacon and Bowness Knott, Ennerdale; *L. attenuata* on ground near Ennerdale Lake (det. H. H. Knight); *Plagiochila asplenioides*, common Wastwater, on Hard Knott, and at Lodore; *P. asplenioides* var. *minor* on stone walls, Borrowdale; *P. spinulosa*, rocks at Lodore; *Odontoschisma sphagni*, Oulton Moss, near Wigton, growing among Sphagnum, also a small clean tuft on the peat; *Adelanthus decipiens*, Borrowdale, on moist rocks; *Blepharostoma trichophyllum*, Roughtin Gill and Lodore Falls, on rocks; *Ptilidium ciliare*, Penrith Beacon and at Wastwater Lake, among mosses; *Radula voluta*, Lodore, on rocks (det. H. H. Knight); *Lejeunea cavifolia*, abundant at Lodore, and at the 'Howk' at Caldbeck.—JAS. MURRAY, Gretna.

## CYCLOSTOMA ELEGANS (MÜLLER) IN DENMARK.

HANS SCHLESCH.

ONE of the most remarkable relics from earlier periods in Denmark is *Cyclostoma elegans* (Müller), its northern limit being in Funen and Zealand. It only exists in those parts of Denmark which have the highest summer temperature.

*Cyclostoma elegans* (Müller) is a late immigrant, having probably entered Denmark during the Stone and Bronze Age, in the Holocene period, when the temperature was higher than now. It is found in Bronze Age dolmens in Schleswig, and at the bottom of a dolmen from the later Stone Age at Myrekær, in the parish of Raklev, near Kalundborg, but it is never found in the 'Kjökkenmöddings,' or in deposits from the earlier *Littorina* period. It frequently occurs, however, subfossil, in upper mould and clay deposits. It possibly formerly lived all over Denmark, as it is noticed subfossil in Northern Jutland, at the limestone slopes towards Vigsö Bay (Steenstrup, 1834) and at Hanstholm in Thy (Beck), in limestone slopes at Dybdal, near Aalborg (Steenstrup, 1837), and at Klitgaard, near Nibe. Further, at Røjle Klint, N.W. Funen (J. P. J. Ravn), and together with *Helicodonta obvoluta* (Müller) on the southern slopes of the island of Ærø (Bierring), and at Voderup Klint (H. Lyngé); in drift sand about 30 metres above sea-level in the island of Nexelö (V. Milthers); at Myrekær (above mentioned) in Bronze Age dolmens (Lyngé); at Helvedes Klint (Milthers) and in Holocene deposits at Strandgaarden, near Kalundborg, together with *Helicodonta obvoluta* (Müller), *Pyramidula ruderata* (Müller), and *Amphibina elegans* (Risso) (A. C. Johansen and H. Lyngé.<sup>1</sup>)

As already mentioned, the recent distribution is in the southern parts of Denmark, and the species is recorded from Lundeberg, S.E. Funen (R. H. Stamm); Stokkebjerg Forest, Odsherred (Budde-Lund); and is recorded as possibly living at Lerchenborg, near Kalundborg (Johansen and Lyngé); a dead specimen was collected by Dr. Jonas Collin in the peninsula of Asnæs, and there is a doubtful record from Köge.

In S.W. Zealand, however, we find *Cyclostoma elegans* (Müller) more common; on the island of Ormö (Steenbuch<sup>2</sup>); at Kalnæs, near Holsteinborg (Steenbuch); at Bisserup in great numbers on the high slopes towards the sea (Steenbuch) and under the same circumstances the present writer found a great number of living specimens during heavy rain at the neighbouring Gumperup Klint in June, 1918,<sup>3</sup> previously found at the same place in 'fresh shells,' by A. C. Johansen. Further, it is recorded from the island of Bogö (?) between

Zealand and Falster, and observed in great numbers in June, 1869, on the small isle of Flatö, between Laaland and Falster, by Alfred Benzon and Jonas Collin, and again collected by Holger E. Pyndt in September, 1925.

*Cyclostoma elegans* is also recorded from Schönhagen, Gute Bothkamp, Amt Bordesholm, Holstein, by Kaestner, 1871,<sup>4</sup> but otherwise it has in Germany a more common distribution along the Weser and the Rhine; it appears in Holland and Belgium and southern England; it is distributed all over France, on the Pyrenean peninsula, in Corsica, Sicily, southwest and east Switzerland, south Tirol, Görz, Friaul, southern Carniola, Wippacher Thal and Semmering, Marburg an der Drau and near Vienna, further in Istria, Dalmatia, Ionian Islands, Albania and isolated in Bulgaria.

*Cyclostoma elegans* is found subfossil at two places in Denmark, together with *Helicodonta obvoluta* (Müller), a species which seems to have immigrated into Denmark during the post-glacial period. The last mentioned was recorded from the wood of Klusris, near Flensburg, in Schleswig, by C. M. Poulsen,<sup>5</sup> but it is now extinct; an isolated example is still found in the N.W. part of the lake of Uklei, in S.E. Holstein.<sup>6</sup>

According to Kreglinger<sup>7</sup> *Cyclostoma elegans* is found subfossil in Sweden ('leere Gehäuse,' i.e., empty shells) in Scania and on Gotland, but I have no nearer trace of this, as it is omitted by Lindström<sup>8</sup> and Westerlund,<sup>9</sup> that *Cyclostoma elegans* has lived there during the Holocene periods.

*Cyclostoma elegans* prefers pure chalk formations, and is best collected during heavy rain.

#### NOTES.

<sup>1</sup> Om Land-og Ferskvandsmolluskerne i holocæne Lag ved Strandgaarden S. S. O. for Kalundborg, og deres Vidnesbyrd om Klimaforandringer (Meddelelser fra Dansk geologisk Foreing V., 11), 1917, pag. 11-12.

<sup>2</sup> Westerlund says in his Fauna moll. terr. et fluv. Svec., Norv. et Dan, Stockholm, 1871-73, p. 423, that this locality, according to Steenbuch is not correct, but it is recorded again by C. M. Steenberg: Danmarks Blöddyr I., Köbenhavn, 1911, p. 209.

<sup>3</sup> Beiträge zur Fauna der Land-und Süßwasser-Mollusken Süd-Seelands (Arch. f. Moll. LVII.), 1925, p. 92.

<sup>4</sup> Beiträge zur Kenntniss der Mollusken im Amte Bordesholm, Kreis Kiel (Nachrichtsbl. d. deutsch. Mal. Ges.), 1873, p. 51.

<sup>5</sup> Fortegnelse over de i Flensborgs nærmeste Omegn forekommende skalbærende Land-og Ferskvands-Blöddyr (Videnskabelige Meddelelser), Köbenhavn, 1867, p. 48.

<sup>6</sup> First noticed by Behn, 1839.

<sup>7</sup> Systematisches Verzeichniss der in Deutschland lebenden Binnenmollusken, Wiesbaden, 1870, p. 5.

<sup>8</sup> Om Gotlands nutida Mollusker, Wisby, 1868.

<sup>9</sup> Fauna Molluscorum Sveciæ, Norvegiæ et Daniæ, Stockholm, 1871-73.

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Prof. C. J. Patton gives 'Researches on the Song Factor in Birds,' in *Discovery* for February.

## CENTAURIUM VERSUS ERYTHRÆA.\*

G. CLARIDGE DRUCE.

I HAVE already shown that the name *Centaurium* clearly belongs to the plants subsequently put under the generic name *Erythræa*, which is, as I hold, wrongly used in the last edition of the London Catalogue.

The name *Centaurium* is of very ancient use for the plants of this genus; Fuchs, Dodoen, Tragus, Mattioli, Parkinson, Bauhin, and the majority of pre-Linnean authors use it.

Tournefort, in his *Institutes*, adopted it, and when Linnæus in the *Sp. Pl.* of 1753 wrongly merged it into *Gentian* he tacitly recognised the historic use of the name by adopting it for the specific name of the Common Centaury, *i.e.*, *Gentiana Centaurium*, therefore, its vernacular and scientific names alike support its use. In 1756 Hill ('*British Herbal*,' 62) well describes it and establishes the generic name as *Centaurium* (with it he includes *Blackstonea* and *Microcala*—genera subsequently separated from it).

*Centaurium* is adopted by Schinz and Thellung, Ritter Beck von Mannagetta, Lindman, Britten and Rendle (as *Centaurion*) and other authors. Its priority is incontestable. Even if Hill be rejected because he did not consistently use binomials, *Centaurium* was restored by Gilibert (*Fl. Lithuan.*, 1-35) in 1781; Moench (*Methodus* 44) in 1794, named species under this name. Rafn (*Fl. Danm. and Helst.*) also used *Centaurium*, and Rupprius (*Fl. Jen.*, 22, 1745) used for it the variant *Centaureum*, and Adanson in 1763 altered it to *Centaurium*.

The name *Erythræa* is of much later date. Borckh. in *Roem. Arch. i.*, 1, 28, 1796, restored Renealm's pre-Linnean *Erythræa* (*Sp. Hist. Pl.* 1611), but, as we have shown, it is invalid.

Therefore, the names *Erythræa Centaurium* Pers. var. *conferta* (Wh. and Salm.) should read *Centaurium Centaurium* Wright or *umbellatum* Gitib. var. *conferta* Comb. nov. It is probably my var. (in part or wholly) *ellipticum* (B.E.C., 569, 1919).

Var. *sublitoralis* (Wh. and Salm.)=*sublitorale* Comb. nov.

*E. Centurium* × *pulchella*=*Centaurium Centaurium vel umbellatum* × *pulchellum* Comb. nov.

*E. Turneri* (Wh. and Salm.)=*Centaurium Turneri* Comb. nov.

†*E. compressa* Hayne (*Fl. Berol.* 65, 1813)=*Centaurium*

\* (B.E.C. 437, 1913, and *Ann. Sc. Nat. Hist.* 242, 1907.)

† Here I give *Centaurium umbellatum* Gilib., *C. vulgare* Rafn., *C. latifolium* (Sm.) Dr., *C. pulchellum* Dr., and *C. capitatum* Dr.

*compressum* Comb. nov. var. *Baileyi* (Wh. and Salm.), with var. *minus* or *minor* and var. *occidentalis* (Wh. and Salm.) Comb. nov.

*Erythræa pulchella* var. *subelongata* (Wittr.) = *C. pulchellum* Dr. var. *subelongatum* Comb. nov.

*E. tenuiflora* Hoffmg. and Link = *C. tenuiflorum* Dr., B.E.C., 350, 1909.

Although *E. compressum* Hayne, 1813, antedates *E. littoralis* Fries., 1814, yet *C. vulgare* Rafn., dates from 1796-1800, so that the specific name *vulgare* should have put under it the varieties *minor*, *occidentale* and *Baileyi*.

It may be added that in the London Catalogue Hill (' Brit. Herbal ') is accepted for the genus *Nymphoides*, which had been established previously by Ludwig in 1737, but Otto Kuntze is the author of *Nymphodes peltatum*, who also, with a slight variation, accepted Hill's name. Kuntze, who does not appear to have been acquainted with Hill's establishment of *Centaurium*, rejects *Erythræa* in favour of the pre-Linnean *Centauroides*, which is invalid.

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**Animal Life in the Sea**, by R. J. Daniel. London: Hodder & Stoughton, Ltd., 119 pp., 5/6 net. This is a scholarly contribution on altogether original lines, and will particularly appeal to naturalists generally, whether they have special interest in marine life or not. The author has many amusing remarks to make about sea-monsters and sea serpents, and endeavours to give some solutions of the records regarding the latter. In addition, he deals with the Giant Squid, Whales, Life in the Shallow Seas, and Some Large Fish.

**Big Game and Big Life**, by J. Morewood Dowsett. London: John Bale, Sons & Danielsson, Ltd., xii. + 242 pp., 21/- net. Still another volume dealing with Big Game has been issued, and in this case New Zealand, Canada, Albania, Iceland, Africa and their Faunas are described. One cannot complain of the number of illustrations, though in many cases they are so small, and the ruling is so coarse that it suggests they were prepared for some newspaper or other similar publication. In addition to his general remarks on Wolves, Bears, Buffaloes, Hippopotami, Deer, Elephant, Lion, Crocodiles and Snakes, etc., the author has an eye for the picturesque, and also gives descriptions of ancient and modern incidents in the history of some of the colonies visited, which will appeal to the younger generation.

**The Geology of the Country around Romford**, by H. G. Dines and F. H. Edmunds. London: H.M. Stationery Office, i.-xiii+53 pp., price 1/6 net. This memoir is an explanation of the geology of the country represented on the one-inch New Series Map, Sheet 257. This area covers the outer parts of the eastern suburbs of London, a part of Epping Forest, and the purely agriculture ground extending eastwards from Romford to Billericay. On the south the subsoil consists principally of deposits of the Thames, the central part is mainly London Clay, while the northern third is diversified with hills capped by Bagshot Sand and Glacial deposits. Accounts of these formations are given, more especially with regard to sanitation and agriculture, while the question of deep-seated water supplies is discussed and illustrated by means of a map showing the depths to the chalk. The map, price 2/-, is well printed in colours.

## SOME YORKSHIRE SAW-FLIES AND ICHNEUMON-FLIES.

W. J. FORDHAM, M.R.C.S., D.P.H., F.E.S.

THE following species of Hymenoptera have recently been determined, among others, by the Rev. F. D. Morice and Mr. Claude Morley; and several are new to the County. I am much indebted to these gentlemen for their kind help.

### TENTHREDINIDÆ (Saw-flies).

- Priophorus tener* Zadd. var. *tristis* Zadd. Barmby Moor, 4/8/24; previously taken at Bubwith.
- Dineura stitata* Kl. Allerthorpe, 5/6/22; Escrick, 30/5/19.
- Cryptocampus saliceti* Fall. Cronkley, 1/6/25; several on *Salix* sp. ('probably *saliceti*.') \*65.
- † *Nematus acuminatus* Th. Skipwith, 25/6/23; probably attached to birch.
- † *Pteronidea pavidus* Lep. Goathland, 9/20.
- † *P. nigricornis* Lep. Allerthorpe, 2/8/24.
- P. myosotidis* F. Allerthorpe, 4/8/24; Robin Hood's Bay, 3/6/24. \*62.
- † *P. pæcilonota* Zadd. Egton Bridge, 5/25, M. L. Thompson.
- Pachynematus clitellatus* Lep. Austwick, 29/8/20. \*64.
- Pristiphora ruficornis* Ol. Barmby Moor, 3/8/24.
- P. pallidiventris* Fall. Allerthorpe, 17/8/25. \*61.
- † *Hoplocampa cratægi* Klug. Robin Hood's Bay, 11/6/24.
- Tomostethus fuliginosus* Schr. Allerthorpe, 21/6/25. \*61.
- Blennocampa pusilla* Kl. Hayburn Wyke, 17/6/24.
- B. tenuicornis* Kl. Bubwith, 26/6/23. \*61; Austwick, 12/5/21. \*64.
- † *B. affinis* Fall. Ramsdale, Robin Hood's Bay, 4/6/24.
- Athalia lineolata* Lep. Robin Hood's Bay, 19/6/24. \*62.
- Selandria morio* F. Bubwith, 18/8/25. \*61.
- † *Stromboceros delicatulus* Fall. Ramsdale, 22/6/24, on ferns.
- Pæcilosoma excisa* Th. Skipwith, 25/6/23. \*61.
- † *Emphytus tener* Fall. Allerthorpe, 12/8/25.
- Loderus palmatus* Kl. Middleton-in-Teesdale, Yorkshire side of Tees, 30/5/25. \*65, a scarce species.
- † *Dolerus sanguinicollis* Kl. var. *ravus* Zadd?—this species. Skipwith, 25/6/23.
- D. nigratus* Mull. Robin Hood's Bay, 8/6/24. \*62.
- Tenthredopsis litterata* Geoff. var. *cordata* Fourc. Allerthorpe, 4/6/25. \*61.
- T. coquebertii* Kl. Allerthorpe, 24/6/23.
- T. nassata* L. Robin Hood's Bay, 3/6/24. \*62.
- T. inornata* Cam. Fylinghall, 20/6/24. \*62.

### ICHNEUMONIDÆ (Ichneumon-flies).

- Cratichneumon fabricator* F. Allerthorpe, 8/25. \*61.
- C. annulator* F. Allerthorpe, 8/25. \*61. Ramsdale, 22/6/24. \*62.
- † *C. fugitivus* Gr. Allerthorpe, 8/25.
- † *C. lanius* Gr. Hayburn Wyke, 17/6/24. \*62.
- Amblyteles subsericans* Gr. Allerthorpe, 8/25. \*61.
- † *A. uniguttatus* Gr. Allerthorpe, 15/9/23, a southern species.
- † *Platylabus phaleratus* Hal. Allerthorpe, 8/25. A rare species, only recorded from Tuddenham Fen, I.O.W. and Ireland.
- Exolytus lævigatus* Gr. Allerthorpe, 16/9/23. \*61.
- † *Cryptus tarsoleucus* Schr. Allerthorpe, 14/8/23.
- Pimpla brevicornis* Gr. Allerthorpe, 12/8/23, 8/25. \*61.

- Pimpla instigator* F. Allerthorpe, 8/25. \*61.  
*Exetastes cinctipes* Retz. Barmby Moor, on *Rubus idæus*, 3/8/24. \*61.  
*Promethus sulcator* Gr. Bubwith, 18/8/25. \*61.  
 †*Mesoleius variegatus* Jur., Allerthorpe, 14/8/22. An uncommon species.  
*Dyspetes prærogator* Gr. Allerthorpe, 15/9/23. \*6.  
 †*Mesoleptus cingulatus* Gr. Allerthorpe, 8/25. Not previously taken so far north.  
 †*Polyblastus variitarsus* Gr. Bubwith, 18/8/25, in a marsh, sweeping. (Curtis gives a figure of this insect on Plate 399.)  
 †*Meloboris dorsalis* Gr. Bubwith, 18/8/25. A rare species, only taken previously in Norfolk and Suffolk.  
 †*M. stagnalis* Hlgr. Bubwith, 18/8/25. Another rare species with few records; not previously so far north.

As usual, the dagger (†) indicates species new to Yorkshire, and the asterisk (\*) species new to a Vice-County.

Since the above note was written, Mr. Claude Morley has kindly looked over a further consignment of Ichneumonidæ, and the following eight species are new to the county:—

- Melanichneumon nudicoxa* Th. Allerthorpe, 8/25.  
*Barichneumon gemellus* Gr. Allerthorpe, 14/8/22.  
*Barichneumon derogator* Wesm. Sandsend, 9/21.  
*Hemiteles politus* Bridg. Allerthorpe, 25/9/20.  
*Homocidus obscuripes* Hlgr. Ramsdale, Robin Hood's Bay, 7/9/20.  
*Homocidus deplanatus* Gr. Allerthorpe, 25/9/20.  
*Erromenus brunnicans* Gr. Allerthorpe, 24/6/23.  
*Ecphoropsis fuscipes* Hlgr. Ramsdale, 7/9/20.

With the exception of the fifth, all the above-named species are uncommon.

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## NOTES ON SOME YORKSHIRE DIPTERA.

W. J. FORDHAM, M.R.C.S., D.P.H., F.E.S.

THE following notes refer to some interesting flies taken by the writer in Yorkshire, largely on Allerthorpe Common and as many of them are new to the county it is thought desirable to place them on record.

For much kind help in the determination of the above-mentioned flies I am greatly indebted to Messrs. J. E. Collin, P. H. Grimshaw, and C. J. Wainwright.

The dagger (†) and asterisk (\*) as usual refer to new County and Vice-County records.

Allerthorpe Common has produced the following species:—†*Pipiza signata* Mg. ? (a specimen of which Mr. Collin says 'appears to run down to *signata*, though in some ways more like *notata* '); †*Carcelia comata* Rdi. ; †*Meigenia bisignata* Mg. ; †*Lydella nigripes* Fall. ; †*L. stabulans* Mg. (also taken at Filey, 8/22) ; †*Exorista glauca* Mg. (also at Skipwith) ; †*Epicampocera succincta* Mg. ; *Chætotachina rustica* Mg. ; *Erigone radicum* F. (new to V.C. 61), bred by Mr. Wigin, at Methley, from *Arctia lubricipeda*, ('Entom.,' 1906, p. 273) ; *Voria ruralis* Fln. (\*61, a gregarious species recorded by Meade from York) ; †*Anachaetopsis ocypterina* Zett. ; †*Brachycoma devia* Fln. (an insect which Mr. Collins has found to be viviparous at Oxford, 'E.M.M.,' 1924, p. 262—it has been bred from

puparia in the nest of a humble-bee); †*Sarcophaga crassimargo* Pand.; *Metopia leucocephala* Rossi (seen entering burrows of various Hymenoptera by Mr. Bradley at Roundhay, and doing the same on Allertorpe Common, \*61); †*Sphecapata conica* Fall. (with the last, also entering burrows); *Dexia vacua* Fln. (\*61); *Mydæa quadrum* F. (\*61); *Cænosiâ rufipalpis* Mg. (\*61); *Helomyza pectoralis* Lw. (\*61); *Tephritis vespertina* Lw. (\*61) and *Elachyptera cornuta* Fln. (beaten commonly out of broom in November).

The near-by village, Barmby Moor, has given *Pipunculus campestris* Ltr. (\*61, also taken at Escrick) and †*Macquartia tenebricosa* Mg.

At Bubwith have occurred †*Sarcophaga vicina* Villen. (also at Filey); *Neottiophilum præustum* Mg. (a fly whose habitat is in birds' nests, \*61); †*Chlorops brevimana* Lw.; †*Borborus pedestris* Mg. (a curious fly with rudimentary wings—a pair of which occurred in flood refuse), and †*Phora abdominalis* Fln. (taken in the carcase of a dead bird, and of which Mr. Collin says 'the first British specimen I have seen of the true *abdominalis*,' the species usually passing under the name is now considered to represent *floreæ* F.).

From a pupa of the lady-bird *Mysia oblongoguttata*, on a birch leaf at Skipwith, I bred a specimen of †*Phora fasciata* Fln. (see *The Naturalist*, 1919, p. 15).

At Melbourne, on sallow bloom, occurred *Syrphus barbifrons* Fln. (\*61), and in a marshy spot *Helomyza lævifrons* Lw. (\*61).

†*Pipunculus strobli* Verr., from Holme-on-Spalding Moor, and †*Sarcophaga striata* Mg., from Filey, complete the tale of East Yorkshire insects.

The North Riding additions are:—*Helomyza ustulata* Mg., a very rare fly on record from Ilkley (\*62); *Trichopticus longipes* Ztt. (\*62) and the Tachinid †*Melanota volvulus* F., from Forge Valley.

*Petinops lentis* Mg., from Robin Hood's Bay (\*62).

*Tephritis ruralis* Lw. (\*62), from Battersby, and †*T. parietina* L., from Clifton Ings, York, on tansy, concerning which Mr. Collin says 'I have not previously seen a British specimen of the true *parietina*.'

The only addition from Vice-County 63 is †*Spilographa alternata* Fln., bred at Shelley by Dr. Smart from Rose Hips.

V.C. 64 gives †*Chlorops meigenii* Lw., taken at Askham Bog.

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## PROCEEDINGS OF SCIENTIFIC SOCIETIES.

H. C. Wilkie describes the auditory apparatus of the Common Mole, *Talpa europæa*, in *The Proceedings of the Zoological Society of London* issued in January.

The Leeds Naturalists' Club has issued an elaborate and very useful 32-page syllabus, with copy of rules, list of members, map of the area for the Society's investigations, and other useful information.

*The Annual Report of the Scottish Marine Biological Association* for 1924-25 deals with the research work carried on in that Institution, together with a Report on the Food of Crustacea; Faunistic Notes; Balance Sheet, etc.

D. A. Allen writes on the 'Volcanic History of Southern Fife,' and S. Tomkeieff on 'Kaolinite-bearing Nodules from Newcastle Coal-Measures,' in *The Proceedings of the University of Durham Philosophical Society*, Vol. VII., Part 2.

*The Seventy-second Annual Report of the Free Public Museums of Liverpool* contains summaries of the Report of the nine years from 1st January, 1915, to March 31st, 1924 (66 pp.). There are views of the Main Hall, Egyptian Section; Collection of Ship Models; and particulars of the donations and purchases during the period are given.

*The Annual Report of the Smithsonian Institution* for 1924 is just

to hand, and besides the ordinary record of valuable and numerous additions, results of researches and explorations, and reports on the various Institutions, there are special articles among which we notice: 'The Origin of the Solar System,' by J. H. Jeans; 'The Drifting of the Continents,' by Pierre Termier; 'The Probable Solution of the Climatic Problem in Geology,' by William Ramsay; 'A Modern Menagerie: More about the National Zoological Park,' by N. Hollister; 'Nests and Nesting Habits of the American Eagle,' by F. H. Herrick; and 'The Breeding Places of the Eel,' by Johs Schmidt.

*The Saga Book of the Viking Society for Northern Research*, containing the *Proceedings*, 1914 to 1918, has just been issued, and helps towards bringing the work of this useful Society up to date. Among the contents of this particular volume we notice 'Manx Crosses relating to Great Britain and Norway,' by Haakon Shetelig; 'Rock Carvings of the Norse Bronze Age,' by Just Bing; 'Some old Historic Homesteads in Iceland,' by H. W. Bannon; 'The English Parish before the Norman Conquest,' by C. B. Stoney; and 'Celtic Tribes in Jutland,' by A. Bugge.

*The Transactions of the British Mycological Society*, issued on February 25th, are excellently edited and printed. Reports on the Fungi and Lichens of the Bettws-y-Coed Foray are given by E. M. Wakefield, G. Lister, and H. H. Knight. W. T. Elliott describes Mycetozoa from Matlock; Mr. T. Petch gives (a) Notes on *Beauveria*, (b) *Mutinus bambusinus*, and (c) *Fusarium pallens*; W. Small writes on the identity of *Rhizoctonia lamellifera* and *Sclerotium bataticola*; H. Wormald records the occurrence in Britain of the conidial stage of *Sclerotinia cydoniæ*; W. Robinson writes on some features of growth and reproduction in *Sporodinia grandis*; R. W. Marsh gives additional records of *Ctenomyces serratis*; and J. S. L. Wardle gives a new British record of *Cladochytrium Myriophylli*.

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An account of the Durham University excavations at Æsica (Great Chesters), by M. R. Hull, appears in *The Durham University Journal* for December.

*Bird Notes and News*, Vol. XI., No. 8, contains notes on 'The Golden Eagle'; 'Bird Sanctuaries'; 'The Trade in Birds' Feathers'; and 'The Oil Menace.'

Dr. Coffin writes on 'Our Herbal Heroes' in *The Medical Herbalist* for January; J. Winterbottom writes on 'Good Health: How to get and keep it'; and J. R. Yemm on 'Herpes.' From the advertisement columns we notice that Messrs. Heath & Heather are herbalists, and Messrs. Potter sell pastilles.

Under the odd heading of 'A Cargo of Notions,' Dr. F. A. Bather gives some useful information on the methods of lighting, exhibiting and arranging cases and specimens in adopted various American and Canadian Museums, as well as useful details of the construction of exhibition cases, etc., in *The Museums Journal* for February.

*The Journal of the Derbyshire Archæological and Natural History Society* for 1925 contains, among the other items, 'Little John's Grave' and 'The Lawful Village Perch,' by S. O. Addy; 'Monastic Settlements in the Peak Forest,' by H. Kirke; 'Notes on Collecting Lepidoptera, 1924,' by H. C. Hayward; and 'Ornithological Notes, 1924,' by H. N. Fitzherbert.

It is somewhat startling to read the following Editorial in the January number of *The Entomologist's Record*: 'It is with much regret that we have to record the decease of our printer, who passed peacefully away on New Year's Day. He wrote us a fortnight ago a cheerful letter expressing his pleasure at having printed the magazines for the past twenty-four years. *The continuance and future of the magazine is now assured!*'

## YORKSHIRE HEMIPTERA IN 1925.

JAMES M. BROWN, B.SC., F.L.S., F.E.S.

DURING the past season new localities have been found for many of the less common species, several very old records have been confirmed, and a number of additions to the county list have been made.

Hemiptera were collected on most of the Excursions of the Yorkshire Naturalists' Union.\*

The recorder has to thank Messrs. R. Butterfield, M. L. Thompson, T. B. Kitchen and W. D. Hincks for consignments of specimens. Uninitialled records are my own.

†=New to the County.      \*=New to the Vice-county.

HETEROPTERA.

*Piezodorus lituatus* F. Previously known in Yorkshire as occasional specimens taken at Skipwith and Scarborough. It occurred this season in profusion on the gorse plants growing on the cliffs at Sandsend. Nymphs were abundant in early August, and by the 16th, adults began to emerge by the score. On one occasion more than two dozen were counted on one shoot of the plant. It seems strange that it was not found on these cliffs during the previous season.

*Elasmostethus interstictus* L. One specimen was beaten in the Arncliffe Woods, G.B.W., 62\* (*The Naturalist*, 1925, p. 187).

*Zicrona cærulea* L. Several were taken under *Calluna*, Goathland, in August.

*Macrodema micropterum* Curt. A number at the roots of plants in the old alum workings, Sandsend.

*Stignocoris pedestris* Fall. Under *Calluna*, Wyming Brook, near Sheffield.

*Drymus sylvaticus* F. Under a log, Sandsend.

*D. brunneus* Sahlb. At the roots of plants, on the cliffs, Sandsend.

*Berytus signoveti* Fieb. On the cliffs, at the roots of plants, Sandsend.

*Acalyptya parvula* Fall. The ordinary short-winged form in turf, Wyming Brook, 63\*, and the less common long-winged form† quite plentifully, also in turf, on the cliff top at Sandsend.

*Derophysia foliacea* Fall. Occurred again at Sandsend, among grass.

*Ploiariola culiciformis* DeG. Was obtained by sweeping plants by stream sides, Keighley, 63\*. R.B. It was previously taken in Yorkshire by T. A. Marshall many years ago, and has probably been overlooked owing to its great resemblance to a gnat.

†*Coranus subapterus* DeG. This interesting addition to the county list was taken in a sandy pit on Allerthorpe Common (*The Naturalist*, 1925, p. 314), W. J. Fordham.

*Nabis ferus* L. Askham Bogs.

*Temnostethus pusillus* H.S. Last year the short-winged form was taken for the first time in the county, while this season the much rarer long-winged form† has occurred at Sandsend.

*Lycocoris campestris* F. Under a log at Sandsend, and in grass, Birley Edge, near Sheffield.

*Phytocoris tiliæ* F. Mulgrave Woods.

*P. longipennis* Flor. Grassington, R.B.; Mulgrave Woods.

*P. dimidiatus* Kb. Keighley, R.B.

*Calocoris striatus* L. Grassington, R.B.

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\* Notices of captures have appeared in *The Naturalist* for 1925, viz., p. 187, p. 217, p. 279, p. 283 and p. 314.

- C. roseo-maculatus* DeG. At Robin Hood's Bay, plentifully on *Centaurea nigra*, as further north (see *The Naturalist*, 1925, p. 114).
- Dichroscytus rufipennis* Fall. On pines, Ryecroft Glen, near Sheffield, 63\*.
- Lygus pratensis* L. Arncliffe Woods.
- L. cervinus* H.S. Mulgrave Woods and Ryecroft Glen.
- L. pastinacæ* Fall. Plentiful on *Smyrniium*, at Runswick Bay.
- Camptozygum pinastri* Fall. Plentiful on pines, Hutton Mulgrave and Ryecroft Glen (adults emerging July 5th), 63\*.
- Monalocoris filicis* L. Arncliffe Woods, plentiful.
- Bryocoris pteridis* Fall. Arncliffe Woods.
- Dicyphus globulifer* Fall. Not uncommon on *Lychnis dioica*, near Sandsend. This species has not been recorded for the county since T. Wilkinson's time (1863).
- Orthotylus ericetorum* Fall. Goathland.
- Harpocera thoracica* Fall. Immature individuals were taken at Middleton-in-Teesdale. 65\*.
- Psallus lepidus* Fieb. Ecclesall Woods. 63\*.
- P. diminutus* Kb. Grassington, R.B. 64\*.
- P. varians* H.S. Grassington, R.B.
- P. roseus* F. Keighley, R.B.
- Gerris lateralis* var. *costæ* H.S. Arncliffe Woods and Cronkley Fell, M.L.T.
- Salda littoralis* L. Cronkley Fell, M.L.T.
- S. muelleri* Gmel. (*oculata*). A single individual occurred under *Calluna*, Goathland (August).
- S. saltatoria* L. Bell-Hagg, near Sheffield.
- S. C-album* Fieb. Mulgrave Woods.
- Corixa nigrolineata* Fieb. Common in pools on Cronkley Fell, M.L.T. and J.M.B.
- C. præstata* Fieb. Cronkley Fell, 65\*, and Ringinglow, near Sheffield.
- † *C. carinata* C. Sahlb. A single specimen in a pool on Cronkley Fell.

## HOMOPTERA.

- Macropsis rubi* Boh. On brambles, Sandsend. 62\*.
- M. cerea* Germ. In the same locality as last year, near Runswick Bay.
- Acocephalus albifrons* L. Sandsend, Hutton Mulgrave Moor, and Malham.
- A. trifasciatus* Fourc. A single specimen on the cliffs, Sandsend. This is the second Yorkshire locality. 62\*.
- A. flavostrigatus* Don. Sandsend.
- Eupelix cuspidata* Fab. In turf, Sandsend. 62\*. This is the second Yorkshire locality.
- † *E. producta* Germ. Also in turf, Hutton Mulgrave Moor (males of both species).
- Doratura stylata* Boh. In turf on the cliff tops, Robin Hood's Bay, in considerable numbers.
- † *Athysanus obsoletus* var. *piceus* Scott. Plentiful among plants in wet places, Hutton Mulgrave Moor.
- Deltocephalus punctum* Flor. Malham.
- D. pascuellus* Fall. Sandsend.
- D. cephalotes* H.S. Malham.
- Thannotettix splendidulus* Fall. Sandsend. 62\*.
- † *Limnotettix lunulifrons* J. Sahlb. A single specimen obtained by sweeping among damp vegetation, Malham.
- L. sulphurella* Zett. Arncliffe Woods.
- Dikraneura flavipennis* Zett. Askham Bogs.
- D. similis* Edw. Malham. 64\*.
- † *Eupteryx melissæ* Curt. On Labiates, in a garden, Millhouses, Sheffield.
- † *E. germari* Zett. Rather plentiful on Pines, Hutton Mulgrave.

*Typhlocyba sex-punctata* Fall. Millhouses, Sheffield.

*T. geometrica* Schr. Arncliffe Woods.

*T. quercus* Fab. Goathland.

*Cixius brachycranus* Scott. Rather common on nettles, Mulgrave Woods. 62\*.

*Kelissia vittipennis* J. Sahlb. On rushes, Hutton Mulgrave Moor.

*Delphax difficilis* Edw. Malham. 64\*.

† *D. discreta* Edw. Askham Bogs.

*D. fairmairei* Perris. Malham, 64\*; Askham.

*Livia juncorum* Latr. Plentiful, Hutton Mulgrave.

*Rhinocola ericæ* Curt. Wyming Brook, Sheffield. 63\*.

*Psylla nigrita* Zett. On Pines, Hutton Mulgrave.

*Trioxa urticæ* L. Wharncliffe.

† *T. galii* Forst. The galls caused by this species have frequently been noticed on *Galium cruciata*, but the insect itself does not appear previously to have been recorded. Immature and mature individuals were common on this plant during August at Sandsend.

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A Great Bustard was found dead on a farm near Thirsk towards the end of February.

The press records a 'fine specimen of an eagle' as having been seen for some days in the vicinity of Flamborough towards the end of February. One report states that it 'carried off a fine fat duck,' but this has been since contradicted.

We welcome a new publication, *Sussex Notes and Queries*, Part I. of which, published by the Sussex Archaeological Society at Barbican House, Lewes, appeared in February. If future issues contain as much and as interesting matter as the first part, it will be of great value, and particularly to the people of Sussex.

*Archæologia Aeliana*, or Miscellaneous Tracts relating to Antiquity (Fourth Series, Vol. I., for 1925, edited by C. H. Hunter Blair), is a remarkable record of the work of this enthusiastic society. Among its multifarious contents, perhaps the following items will more especially appeal to our readers: 'The Microlithic Industries of Northumberland,' by F. Buckley; 'Roman Durham,' by J. A. Petch; and 'Early Carved Stones at Hexham,' by W. G. Collingwood.

From *The Shooting Times* we gather that a letter 'of great interest' has been received from one of their correspondents: 'There are still a tremendous amount of badgers here despite the trapping, though you find a lot with toes missing, etc., and it's quite exterminated the polecats and pine martens, which used to give a lot of sport with the terriers. And foxes and otters are getting very scarce, and pheasants and partridges all get caught. We have a plan on foot, I do not know whether it will mature or not, for members of the hunt to form a club to take the rabbits on all the farms we can, and ferret or snare instead of trapping. If it pays the trapper it should pay us, and the farmers are all right, but they cannot afford to refuse say £30 for their rabbits.'

We learn from *The Montgomery Times* that Mr. Hugh G. Powell, of the Buck Hotel, Montgomery, had remarkable success in a badger hunt in the Chirbury district recently. By the invitation of three neighbouring farmers, Mr. Marsh, Kinton; Mr. Davies, Rockybank; and Mr. Henry Jones, Upper Heightley, he took four of his terriers to the earths on their land, with the object of hunting out badgers which had been giving some trouble. A pair of badgers was found in the earth at the Sheds Holes, and the terriers were put in. The boar put up a great fight, and took a considerable time to kill. His mate was afterwards routed out and quickly despatched. The pair weighed 58 lbs., and were in splendid condition. Their weight is believed to be a record for the district.

## CORRESPONDENCE.

## BRITISH ASSOCIATION CORRESPONDING SOCIETIES.

The following Memorandum has been issued to all the above Societies :

With reference to the report of the Conference of Delegates of Corresponding Societies at the Southampton Meeting, 1925, the Corresponding Societies Committee wishes to impress upon the societies which nominate delegates to attend the forthcoming annual meeting in Oxford (August 4th-11th), the desirability of ensuring that their nominees (a) will be able to attend the meeting, and (b) will regard it as a primary duty to attend the Conference of Delegates on the Thursday and Tuesday during the meeting. To the Southampton meeting, fifty societies nominated delegates, but at the first meeting of the conference only thirty-two were present, representing thirty-seven societies, and at the second twenty-three, representing twenty-eight societies.

In regard to the resolutions adopted by the Conference at Southampton, and quoted in the report, the following action has taken place.

1. The resolution upon the facilities offered by local societies in regard to education was referred to the Ministry of Agriculture and the Board of Education.

The Ministry of Agriculture replied that 'matters bearing on the curriculum of elementary, secondary and technical schools are the concern of the Board of Education. The Ministry, however, is the supervising authority in respect of agricultural education provided at University Departments of Agriculture and Agricultural Colleges, and by County Councils as regards students over school age. If you will be good enough to forward a list of the local scientific societies to which you refer, the Ministry will be prepared to circulate the list to the Colleges and County Councils for their information. The Ministry would suppose, however, that the majority of the staffs of Agricultural Colleges and County Farm Institutes are already aware of the existence, and are probably also members of these local societies.'

The Board of Education replied that 'the facilities offered by local scientific societies, and their more effective and general utilisation, the Board suggest that the activities of these societies are well known, as a rule, to Local Education Authorities and the Governing Bodies of Schools, both through teachers who are members of such societies and in other ways. Where, however, there may, in any instance, be reason to suppose that this is not the case, the Board see no reason to think that the local society would be likely to experience any difficulty in approaching the appropriate authorities. That any such approach is best made by the society itself is suggested by the fact that they are acquainted with the local conditions, and know the nature and extent of the particular facilities which they are in a position to offer.'

2. Correspondence is in progress in regard to the spoliation of ancient monuments on Dartmoor.

3. The Council has taken note of the desire for the extension of regional surveys. Sir John Russell, who has accepted the presidency of the Conference at the Oxford Meeting, August 4th-11th next, is understood to take a special interest in this question.

4. In regard to the extermination of British plants and animals, a letter has been received from the Hon. Secretary-Treasurer of the British Correlating Committee for the Protection of Nature (British Museum, Natural History, Cromwell Road, London, S.W.7), from which the following is an extract.

'I was instructed to inform you that any information received

by you from your Corresponding Societies regarding the threatened extermination of British plants and animals, would be welcomed by our Committee.

If you will be kind enough to pass on to us any information so received upon which you think action should be taken, we shall be pleased to refer it to the Society best fitted to deal with it.'

5. All Corresponding Societies have been informed of the resolution relating to the presentation of papers to bodies preparing bibliographies. In response to requests for information as to such bodies, a list of those known at the Association office is appended :

Institution of Chemical Engineers, 307 Abbey House, Victoria Street, S.W.1.

Institution of Petroleum Technologists, Aldine House, Bedford Street, W.C.2.

Zoological Society (*Zoological Record*), Regent's Park, N.W.8.

Society of Antiquaries, Burlington House, W.1.

Royal Geographical Society, Kensington Gore, S.W.7.

Geological Society, Burlington House, W.1.

Physiological Society (*Physiological Abstracts*), Messrs. H. K. Lewis & Co., 136 Gower Street, W.C.1.

Physical Society (Imperial College of Science and Technology, South Kensington, S.W.7), in co-operation with the Institution of Electrical Engineers (*Science Abstracts*, monthly).

In regard to the reference by the Conference, to the Corresponding Societies Committee, of the question whether the list of papers bearing upon the Zoology, Botany, and Prehistoric Archaeology of the British Isles, accompanying the reports of the Conference, should be continued, the Committee passed to the Council the answers to enquiries made as to the extent to which the list was used. The Council decided that the preparation and publication of the list by the Association should be discontinued after the appearance of the current list. The thanks of the Council were accorded to Mr. T. Sheppard for his unsparing work in connection with the list. The suggestion that the printed list might be replaced by a card index was not favoured.

24th February, 1926.

O. J. R. HOWARTH, *Secretary*.

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**Parasite of *Yponomeuta euonymellus*.**—As there appears to be nothing from the Hymenoptera Committee in the Entomological Section's Report, presented at the Annual Meeting of the Yorkshire Naturalists' Union (*The Naturalist*, January, 1926, p. 54), it is advisable to state that the hymenopterous parasites bred from the larvæ of *Yponomeuta euonymellus* (= *padi*) found by Mr. R. J. Flintoff at Goathland (*The Naturalist*, September, 1925, p. 270), were determined for me by Mr. G. T. Lyle as *Angitia chrysosticta* Gmel. Mr. Lyle says the species was bred from the same host in Devon many years ago by the late Mr. G. C. Bignell, but apparently there has been no other record of it in Britain since then until now, although it probably has been bred by others in the interval.—GEO. T. PORRITT, Elm Lea, Dalton, Huddersfield, February 8th, 1926.

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The new President of the Royal Anthropological Institute of Great Britain and Ireland is Mr. H. J. E. Peake.

## NEWS FROM THE MAGAZINES.

*Discovery* once again changes its editor.

A portrait of the late Dr. W. E. Hoyle appears in *The Museums Journal* for March.

J. Delacour and M. Legendre write on 'Hoopoes' in *The Avicultural Magazine* for March.

Dr. James Ritchie describes 'Abnormal Coloration in Scottish Mountain Hares,' in *The Scottish Naturalist* for January-February.

Valuable observations on the Golden Eagle, by D. Macdonald, and on the Tufted Duck, by H. Boase, appear in *British Birds* for February.

Dr. F. A. Bather continues his miscellaneous notes on various methods of museum preparation under the title of 'A Cargo of Notions,' in *The Museums Journal* for March.

The principal contents of *The Entomologist* for March are: A Winter Entomological Visit to Central Brazil; the Rhopalocera of the Phillipines; and Noctuidæ from Central Buru.

Part I. of *Word Lore*, The Folk Magazine (London: Folk Press, Ltd., Ranelagh Road, 40 pp., 9d.), contains many valuable contributions on the subject covered by the title.

*The Journal of the East Africa and Uganda Natural History Society* for January contains 'Local Archæology in Kenya Colony,' by G. W. B. Huntingford; and 'Sunworship amongst the Kipsikis or Lumbwa,' by C. E. Ward, the former being well illustrated.

Among the contents of *The Vasculum* for January are: 'Prehistoric Man in Northumberland,' by W. P. Hedley; 'The Status of the Stonechat in the North-eastern Counties,' by W. Raw; and 'The Golden-8 Moth (*Plusia moneta*),' by C. Nicholson.

*The Irish Naturalists' Journal* contains 'Notes on the Wolf in Ireland'; 'The Hedgehog'; 'The Ecology of Rock Pools,' and 'A Harvest Custom of Eastern Ulster.' There is a Children's Page; a Botanical Enigma; Siftings, and other evidences of a desire to make the magazine popular.

*The Entomologist's Monthly Magazine* for March contains records of *Euplectus afer* Reitter var. *infirmus* Raffray, *Phyllodrepa puberula* Bernh., and two gall-midges (Diptera, Cecidomyidæ), all new to Great Britain. There is also a record of lead having been bored through by the furniture beetle at the Flask Inn, near Scarborough.

E. G. R. Waters writes on 'Pyrilidina and Tortricina in the Oxford District'; F. W. Edwards gives 'Additions to the List of British Crane-flies,' and also describes a 'New Species of *Dixa* from Sussex'; and A. Cuthbertson writes on 'The Swarming of Crane-flies,' in *The Entomologist's Monthly Magazine* for February.

*The Essex Naturalist*, covering the period October, 1925, to March, 1926, principally refers to the Epping Forest area, and its pages include notes on Birds; Bugs; Water turned to 'Blood'; The Origin and Development of the Lea Valley. Prof. J. W. Gregory contributes an excellent report on the Conference of Delegates at the British Association Meeting, 1925.

'H. J. E. P.,' writing in *The Museums Journal* for February, states, 'At Bryn Newydd, near Prestatyn, in Flintshire, Mr. Gilbert Smith has found seven skeletons associated with worked flints. Mr. Smith claims that they are neolithic, but, from the evidence published, they may well be later.' We are glad to find that Mr. Peake's views coincide with those already expressed in *The Naturalist*.

The January issue of *The Murrelet*, the official bulletin of the Pacific North-west Bird and Mammal Society, published by the State Museum,

University of Washington, Seattle (26 pp., quarto), is issued by means of the typewriter, and among its contents are: 'The Mystery of the Marbled Murrelet,' by A. Brooks; 'Ten Days among East-side Birds and Mammals,' by J. M. Edson; 'A Study of Bird Stomachs and their Contents,' by J. H. Bowles; 'Nesting Habits of Richardson's Pine Squirrel,' by L. K. Couch; and 'A Nesting Colony of the North-west Coast Heron,' by J. M. Edson.

*The Journal of the Manchester Geographical Society* (Vols. XXXIX.—XL., Parts i.—iv., 1923-24, 262 pp.) has recently been published, and among its many valuable papers contains 'The History of Cartography,' by W. H. Barker; 'The Origin of the Manchester Plain,' by Prof. O. T. Jones; 'Cheshire Villages,' by H. W. Ogden; 'The Distribution of Population in South-west Lancashire: its Social Significance,' by H. King; and 'The Development of the Alkali Industry in the Mersey Area,' by H. Thomas.

A new publication has appeared, issued from the Williams and Wilkins Co., Baltimore, U.S.A., the English agents of which are Messrs. Bailliere Tindall & Cox, London. It is *The Quarterly Review of Biology*, Part I., of which contains 137 pages, 8 plates, and 99 figures. The subscription is a guinea per annum. It is well produced, and the part before us contains 'The Biology of the Mammalian Testis and Scrotum,' by C. R. Moore; 'Symbiosis Among Animals, with special reference to Termites and their Intestinal Flagellates,' by L. R. Cleveland; 'Experimental Studies on Morphogenesis in the Nervous System,' by S. R. Detwiler; 'A Review of the Discovery of Photoperiodism: the Influence of the Length of Daily Light Periods upon the Growth of Plants,' by K. F. Kellerman; and 'Recent Discoveries in the Biology of Ameba,' by A. A. Schaeffer.

————: o :————

## NORTHERN NEWS.

The death has recently occurred of Dr. B. N. Peach, one of the greatest authorities on Scottish geology.

Mr. Charles Mosley has been promoted from Assistant to Curator of the Tolson Memorial Museum, Huddersfield.

The Botanical Collection of the late J. A. Wheldon, of Liverpool, has been purchased by the National Museum of Wales.

Dr. F. A. Bather, F.R.S., has been elected President of the Geological Society, and a foreign member of the Kaiserliche Leopoldino-Carolinische Deutsche Akademie der Naturforscher, in Halle.

We should like to congratulate our contributor, Mr. W. S. Bisat, on receiving the proceeds of the Murchison Fund from the Geological Society of London at the recent Annual Meeting of that Society.

In reply to our enquiry in the March issue (p. 95) as to which museum in the provinces can be looked upon as the first, we have received claims to that distinction from twenty-two institutions. None gave the correct answer!

A recent writer in *The Bradford Daily Telegraph* gives a pathetic account of the courtship and tragic death of a tame goose and a 'wild goosander or male goose.' Ignorant people would shorten the word to 'gander.'

The Museum of Practical Geology, Jermyn Street, is again 'closed for repairs.' The library may be approached through the Piccadilly door, which, we believe, was inserted as the result of a letter by the present writer in *The Times*.

We regret to record the death of Dr. William Bateson, F.R.S., who was the President of the British Association in 1914; was a Trustee of

the British Museum; the author of 'Materials for the Study of Variation,' and other works; and one of our leading British zoologists.

From Mr. R. Brinkmann, of Gottingen, who has recently been studying the Oxford clay series in this country, we have received the following papers: 'Der Dogger und Oxford des Sudbaltikums'; 'Uber eine Scholle von Oberem Lias auf Wollin'; and 'Uber petrographisch-geophysikalische Grenzfragen.'

At a recent meeting of the Linnean Society, Dr. H. Hamshaw Thomas opened a discussion on the relation between the Caytoniales and the Flowering Plants. There is no doubt of the importance of Dr. Thomas's work. He has proved the existence, in Jurassic times, of a race of plants with angiospermous fruits, long before the earliest previous record of Angiosperms.

The results of modern methods of research on the constitution of metallic alloys and on the effects of varying mechanical and thermal treatment on their structure and mechanical properties have increased our knowledge of the nature of bronze implements, and in *Nature*, No. 2926, Professor C. O. Bannister and J. A. Newcombe give the result of examinations of Bronze Implements from Shrewsbury.

The death is announced of Richard Buller Newton, well known as a geologist and conchologist—formerly on the staff of the Geological Department of the British Museum. He was born in 1854, and obtained work at the Geological Survey at the early age of 15 years. He received the Wollaston Fund from the Geological Society in 1914, and had occupied the Presidential Chairs of the Malacological and Conchological Societies.

In a certain 'popular journal of knowledge' for February is an article in which a large illustration of a sea anemone is described as a wolf-fish, two fine wolf-fishes are described as 'a jelly fish,' and a typical jelly fish is described as a 'plumose anemone.' An article follows on 'Should Scientific Research be Rewarded.' If this method of mis-naming is considered to be 'scientific research,' we think it should be rewarded, adequately.

A new series of publications has been issued by the Department of Zoology at the University College of Wales, Aberystwyth. No. 1, for the year ending 30th June, 1923, has recently appeared, edited by Professor R. Douglas Laurie, and contains a report on Marine and Fresh Water Investigations (48 pp., 5s.). The papers included are: 'Introduction,' by R. D. Laurie; 'Investigations on Cardigan Bay Herring,' and 'Additions to the Marine Fauna of Aberystwyth and District,' by E. Emrys Watkin.

We notice from the 'Report of the Visitors to the Ashmolean Museum, Oxford,' that 'In accordance with the general principle that, when an associated group of objects has been split up into two or more shares, the owner of the larger share has a just claim to the whole, if he offers in exchange something of more or less equal value, the Visitors have granted to the Municipal Museum, Hull, three constituents of the Everthorpe "founder's hoard" (Hull possesses the rest) against four bronze palstaves found at Windsor, and offered by the Hull Museum.'

In presenting the Balance of the Proceeds of the Murchison Geological Fund to Mr. William Sawney Bisat, at the recent annual meeting of the Geological Society of London, the President addressed him in the following words: 'Mr. Bisat, by the award to you of the Balance of the Proceeds of the Murchison Geological Fund, the Council recognizes the great value of your researches on the Carboniferous rocks of Yorkshire, and more especially the marine bands in the Upper Carboniferous. Your accurate work on the determination of the Goniatites of these rocks marks a distinct advance, which has been welcomed, not only in this country, but also on the Continent of Europe and in America.'



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PRINCIPALLY FOR THE NORTH OF ENGLAND.



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and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,  
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RILEY FORTUNE, F.Z.S.

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# YORKSHIRE NATURALISTS' UNION.

## YORKSHIRE CONCHOLOGICAL SOCIETY.

The Yorkshire Conchological Society will hold a joint meeting with the Yorkshire Naturalists' Union (Conchological Section) at York on the 19th June [not 12th June as stated in error in the Yorkshire Naturalists' Union Syllabus], for the investigation of the River Foss. Leaders: Messrs. Sowden and Smith.

JOHN R. DIBB,

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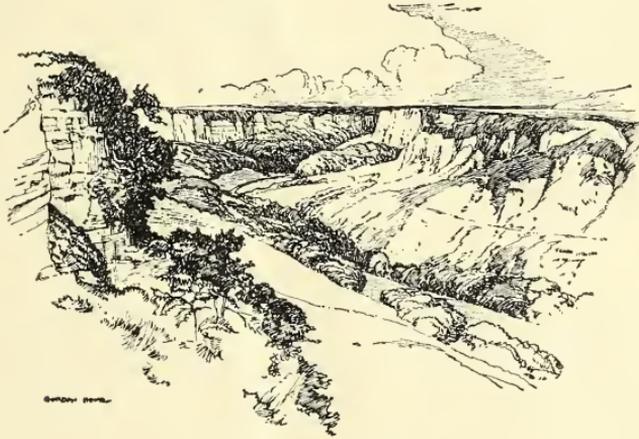
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## NOTES AND COMMENTS.

## THROUGH YORKSHIRE.\*

Mr. Gordon Home's work is so well known that we feel sure all that is necessary is to draw attention to the fact that Messrs. J. M. Dent & Sons have issued an excellent description of the county, with illustrations of many of its charms, at the low price of 2/6. Mr. Home commences with Hull, 'the base from which an exploration must begin, for roads and railway radiate from the town, and from Spurn Head to the chalk cliffs of Flamborough there is no means of following the coast-line at all closely.' The publishers enable us to reproduce one of the many charming illustrations.



In the Deep Canon of Newton Dale.

## WILLIAM SMITH.

There is on exhibition in the William Smith case in the British Museum (Natural History) a little volume containing the autograph of this celebrated geologist. It is 'Euclide's Elements,' edited by Dr. Isaac Barrow, Fellow of Trinity College, Cambridge, published in London, 1660. The volume is inscribed:—

William Smith  
his book  
bought  
of  
C. W.  
of  
Stow  
January the 28th  
1790.

Smith was 21 in that year, and was learning the profession of

---

\* 'Through Yorkshire.' x. + 182 pp.

land-surveying from Mr. Edward Webb, of Stow on the Wold, at the time. The volume belonged to John Phillips, afterwards to Dr. Henry Woodward, and at his death was given to Mr. Davies Sherborn.

#### WAR ON SEALS

We learn from the Press that the Ministry of Agriculture and Fisheries has written the Eastern Sea Fisheries Board—which has jurisdiction over the Lincolnshire and Norfolk coast—stating that they have no objection to the Fisheries Committee incurring an expenditure not exceeding £250 during the current and subsequent financial years on the payment of rewards for the destruction of seals, out of their own funds, at 20s. or less for each seal killed within their area. During the limited period to which this arrangement applies, the Ministry hope to make investigations into the food of the seal, and, therefore, ask the Committee to co-operate in obtaining the necessary portions of seals for examination. The seals breed on the Wash. Acting on this, the Eastern Sea Fisheries Board has decided to offer 10s. for the nose of each seal killed, and 10s. for each stomach supplied, the latter offer being limited to ten.

#### WAKEFIELD AWAKES.

In an article of a column's length, in a Yorkshire paper recently, headed 'Wakefield Museum,' the first part seems to be devoted to the history of Wakefield, and the latter part to the question of the export of relics to America; but reading carefully one gathers that ostensibly the notes are written to describe a gift of works of Art to the Museum. The report goes on to say: 'the success which has attended the efforts of people in the Wakefield district may be some encouragement to other towns to either start a museum, or, before it is too late, to appeal to local patriots to contribute to existing museums, so that something may be saved for the English people!' The article appears in March, 1926, and is not, as might be assumed, under the heading now frequently appearing in papers, 'News of a Century Ago.'

#### NATURE STUDY.

We learn from the press that 'the most deadly thing in this world is to have someone else using his brains for you.' This was a phrase adopted to emphasise the main point of reflections by Dr. Harold Wager, F.R.S., contained in a very entertaining address given by him to the School Nature Study Union at University College, London, in connexion with the annual Conference of Educational Associations. 'In the hands of the right people nature study is capable of becoming a very important means of education. But I cannot help thinking that teaching is overdone. Children,

I fancy, dislike being taught—and I don't wonder at it sometimes. The way to get children interested in nature study is to allow them, so to speak, to teach you.' Dr. Wager was severely critical of what he called the 'mechanical' method of teaching children nature study. In this connexion he told a story of a boy student of physics, who prepared a paper dealing with the specific gravity of something, which was excellent, except that he persisted in writing of 'specific gratitude,' instead of 'specific gravity.'

#### DR. WAGER'S VIEWS.

'Rather than teach nature study merely mechanically, leave it alone,' was Dr. Wager's advice. 'In order to deal with nature study properly you must go straight to nature, and not to writings about nature. Inspire your pupils—and you have done the whole trick.' The way of awakening the attitude to nature study which he recommended would have the effect of creating in children self-reliance and independent powers of thought and judgment. It would also develop the spirit of inquiry, and lead children to understand that everything that appeared in print was not necessarily true. 'I sometimes feel that human credulity is a much more serious menace to the race even than human mendacity.' Applying his theories about nature study generally, he said: 'To take a person by the scruff of the neck, and say, "Love nature"—well, it can't be done.' One of the difficulties was that so many people who were fond of music, art, or literature had very little desire to know about the world. Quoting Plato to the effect that philosophers must always be few in number, Dr. Wager said he thought, according to his own experience, that that was rather true.

#### THE PHILOSOPHY OF LIFE.

*The English Review* recently offered three prizes to the three readers submitting from any speech, sermon, or article the most notable passages appearing or reported between February 15th and March 15th. A Leeds reader submitted the following extract from a leading article in *The Yorkshire Post* of February 23rd, and was awarded the first prize:—  
'Whether a man accept authority, as Christians do, or gazes alone into the abyss of doubt, as agnostics do, the philosophy of life which he embraces, and which inspires him, still turns in its relation to happiness upon his own attitude to being. If he is amused, inspired, awed, thrilled, or in any way moved by the spectacle to which the gift of existence for too brief a space has admitted him, if he is interested in the play and interplay of circumstance and personality which is unfolded before him and in which he himself participates, he cannot be other than grateful to the Unknown that he lives. Birth and

life are acts of grace, with all the adornments that the same grace gives to living. Realising this a man is happy, no matter what befalls him. Questioning this, happiness escapes him.'

VERTEBRATES OF THE MANCHESTER DISTRICT.

At a recent meeting of the Literary and Philosophical Society of Manchester, Mr. T. A. Coward read a paper on 'The Vertebrates of the Manchester district: a contribution to the regional survey.' 'There are moorland, foothill, lowland, mossland, and urban faunas. The true moorland fauna has, perhaps, the most exclusive character; it is confined to the higher hills to the north and east of Manchester, typical grouse-moors with spongy mosses and rocky outcrops. The foothill and lowland faunas have much in common, though certain animals are typical of each. The foothills lie south and west of the moors; the lowlands, partly agricultural, partly suburban, extend farther to the south and west, and contain many parks, woodlands, and lakes or meres inhabited by animals which are mainly characteristic of these environments. The mosslands are, or were, in the river valleys, and are in a transition stage, drainage and cultivation and the growth of residential areas constantly altering the character of the fauna. The urban fauna is that which is restricted by the populated areas, and it too suffers change through increase in population, but is recovering some of its former character under the influence of municipal protection and the provision of open spaces and parks.'

ISOSTASY.\*

What is it rules the upper crust ?

Isostasy, Isostasy.

What actuates the overthrust ?

Isostasy, Isostasy.

What gives the shore lines wanderlust ?

What humbles highlands to the dust ?

What makes the strongest stratum bust ?

Isostasy, Isostasy.

Conservatives in vain have cussed

Isostasy, Isostasy ;

The strongest power on earth is just

Isostasy, Isostasy.

So let us down our deep disgust,

If we'd seem up to date we must

Roll up our eyes and take on trust

Isostasy, Isostasy.

---

\* Sung at the annual dinner of the Geological Society of America, Washington, 1923, and quoted in the Report of the British Association for the Advancement of Science for 1925.

## THE DESCRIPTION OF NEMATOCEROUS FLIES, ESPECIALLY CHIRONOMIDÆ.

GEORGE GRACE, B.SC.

THE scheme outlined in Mr. Grimshaw's Presidential Address at Sheffield\* for the systematic study of Yorkshire Diptera is now in existence so far as the Chironomidæ are concerned. Several members of the Y.N.U. have been at work on that family for over a year, and have made considerable progress.

Our first task was to prepare detailed and standardised descriptions of all our Yorkshire species, and one of our earliest difficulties has been the absence of any convenient information about the meanings of the terms used in describing flies. The following explanation of these terms was prepared, primarily, for the use of this group of workers, and in writing it I have been thinking mainly of the Chironomidæ, but as most of the terms are in use in descriptions of all nematoceros flies, the notes may be of interest to students of other families also.

Among many families of nematoceros flies, and especially the Chironomids, things are very different from what they are among Coleoptera and Lepidoptera. Most of even the commonest species have never been adequately studied, and the amount of work done on them in Yorkshire is almost negligible. We therefore decided, not so much to attempt to give names to our captures, as to give accurate descriptions.

In this we have had continual assistance and encouragement from Mr. F. W. Edwards, of the British Museum, who has given a considerable amount of time to guiding us along the right lines, and who has, too, kindly looked over this paper, and made suggestions for increasing its usefulness.

### BODY LENGTH.

When a fly has been pinned, the first useful point to be noted is its length, not including the antennæ, or legs. This and all measurements are best recorded in millimetres. Earlier writers appear to have laid great stress on this length, and there is no doubt it is sometimes useful, but many flies are so frail and shrink so much during drying that, unless fresh flies can be used, the measurement is only useful in a general way. A much more dependable measurement is the length of the wing, as described later.

### HEAD CAPSULE (Fig. 1).

The terms used in describing the head are as follows :—

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\* See *The Naturalist*, 1925, pp. 5-20.

**EPICRANIUM.**—A general name for the upper part of the chitinous shell of the head, from the frons in front to the neck behind.

**OCCIPUT.**—The hinder part of the epicranium, from the vertex to the neck.

**VERTEX.**—The area above and behind the eyes.

**FRONS.**—Comes below the vertex and between the eyes down to and around the antennæ. There is often no definite boundary between the vertex and the frons.

In some species of *Chironomus* and *Tanytarsus* small projections known as **FRONTAL LOBES** are found just above and inside the antennæ. It has been suggested that these may be the functionless remains of ocelli, but this seems doubtful. The presence, or absence, of these lobes should

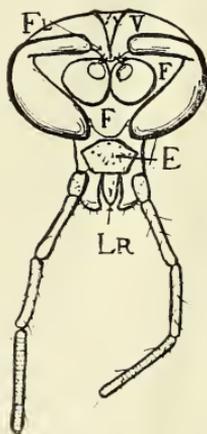


FIG. 1.—Head of *Chironomus*.

V.—Vertex. F.—Frons. FL.—Frontal Lobes.  
E.—Epistome. LR.—Labrum.

be noted, as they serve to distinguish certain groups of species. The colour of the vertex and frons, too, is of moment.

The remainder of the head, below the antennæ, is known as the **ROSTRUM**. Below the suture dividing the frons from the rostrum is a prominent plate with long sensory hairs known as the **EPISTOME** or **FRONTO-CLYPEUS**, and below this again are the mouth parts. These are very much specialised in *Diptera*, and their homology is by no means fully understood.

In *Chironomids* and similar flies the **LABRUM** or 'upper lip' is the conspicuous central projection below the fronto-clypeus. The **LABIUM** or 'lower lip' is absent or very inconspicuous, and is represented by the **LABELLAE**, the two lobes on either side of the labrum. Of the two pairs of jaws found in more generalised insects, the **MANDIBLES** or 'upper jaws' are absent except, possibly, in the females of certain

species of Simulidæ (Imms. *Ent. Mon. Mag.*, 1920). The 'under jaws' or MAXILLÆ, too, if present, are inconspicuous, but the maxillary PALPS are always prominent as the pair of segmented appendages, often longer than the whole face, which project downwards from the sides of the mouth. In Yorkshire Chironomids they always consist of four segments which vary in relative length in different species, and may sometimes be usefully measured.

The inside of the mouth is made of a softer lining which has been divided into the EPIPHARYNX or roof, and the more tongue-like HYPOPHARYNX arising from the floor. These terms are not of much use in systematic work.

#### THE COMPOUND EYES.

One of the most conspicuous features of the head is the large compound eyes, each with 200-250 facets (OMMATIDIA). The shape of these eye masses varies in different genera, being sometimes reniform, as in Fig. 2, with dorsal extensions (DORSAL BRIDGE), which make the vertex very narrow, and sometimes with hardly a trace of these extensions, and, therefore, oval, when they are said to be ENTIRE. The distance between the eyes at the vertex compared with their depth is occasionally used in describing species. It can be most compactly recorded as a fraction where the numerator is the distance across the vertex and the denominator the depth of the eye.

In some cases the eyes are quite bare, but in others minute hairs occur around each facet, and they appear pubescent when seen against the light under a low objective. The length of these hairs varies in different cases, sometimes they can be seen with a hand lens, but in others they are so minute that they can only be recognised in potashed specimens under  $\frac{1}{4}$  in. or  $\frac{1}{6}$  in. objective. The presence or absence of this pubescence is an important point, as it is used to distinguish several genera.

#### OCELLI.

Simple eyes, or ocelli, are absent among the Chironomids, but are an important feature in certain other families.

#### ANTENNÆ.

Between the eye masses are the almost globular basal segments of the antennæ, the SCAPES or BULLI. These remain fixed to the head when the other parts of the antennæ are removed. According to Miall and Hammond ('The Harlequin Fly,' 1900) they are the second segments, the first being buried in the head, but in systematic work they are always regarded as the first. Their colour should be noted, as it is

often different from that of the face. The remainder of the antennæ among nematocerous flies consists of a number of segments placed end to end forming the FLAGELLUM. The number of these segments varies, not only with different genera, but also in the two sexes. Most of them bear whorls of longer or shorter hairs known as VERTICILS, which, in the case of male Chironomids, are so well developed as to form a conspicuous PLUME. On a few of the basal and sometimes on the terminal segments are found a number of short transparent spikes known as SENSE BRISTLES or HYALINES. These are supposed to be the seat of some sense akin to smell.

Among male Chironominæ the last segment is very much longer than the others, and the ratio obtained by dividing the length of this by the combined lengths of the remainder (not including the scape) is often of great assistance in recognising species. It is known as the antennal ratio (A.R.), and is most compactly expressed as a decimal, *e.g.*, the length of the 14<sup>th</sup> segment of a *Metriocnemus longitarsus* was 130 units, and of 2-13<sup>th</sup> was 72. The A.R., therefore, was 1.8. Ten different examples of this species gave figures from 1.9 to 1.65, whereas a closely allied species never gave less than 2.5.

Among the Tanypines it is the last segment but one which is elongated, and the last is quite short. The most useful ratio is obtained by dividing the length of the penultimate segment by the combined lengths of the preceding. The number of segments in the male antennæ of Chironomids varies from 12 to 15, but among females there are two distinct types. The female Tanypines have usually 15 segments, whereas the female Chironomines have only 6-8. In no case is the final segment in the female so long as in the male, and the plume is much more meagre, but the hyalines are better displayed, and the shapes of the individual segments are more varied.

They are described as fusiform (*i.e.*, spindle shaped), flask shaped, oval, etc.

(To be continued).

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**Romances of Natural History**, by J. J. Simpson, D.Sc. 108 pp., 3/6. The Keeper of Zoology in the National Museum of Wales continues to 'broadcast' on zoological topics, and in the present volume of a hundred thick pages, gives his talks, rewritten, on Eels, Clothes-moths, Malaria, the Fly, Spider, Bee, Tortoise, Chameleon, Alaska Seal, and Platypus. The author is apparently his own publisher, and tells us his romances of everyday biology are scientifically accurate, and in simple language! He also modestly states 'many of the subjects dealt with here, besides being informative, have a very practical bearing. To the bee-keeper, to the housewife, to the lover of pets, to the sanitarian, there are hints of practical value. There is something to interest all.'—F.

## NOTES ON YORKSHIRE AMMONITES.

DR. L. F. SPATH.

## VIII.—MORE LOWER LIASSIC FORMS.

*(Continued from p. 49.)*

As in many other ammonites, whilst the adult of *Gagaticeras* are remarkably similar, the more plastic young show great variability. There may be several 'species'; as in *Echioceras* of the *varicostatoïdes* type they are not yet known to be even of stratigraphical value. In the embryonic (protoconch) and brephic (primitive) stages<sup>1</sup> *Gagaticeras* has depressed, smooth whorls. These, of course, are found also in all other ammonites, and their systematic value is nil. Differences are inappreciable in comparison with the variability of the shell-nuclei in, e.g., recent gastropods or Carboniferous goniatites. So soon as ornamentation appears, and the peripheral area begins to differentiate, we find at once the greatest diversity; whether we consider it normal or abnormal growth, it is not palingenesis. Some of these young undoubtedly resemble *Promicroceras* in the ventral flattening of the ribs; in others the costæ continue unchanged across the periphery, and in a third type of young these ribs are not straight across the venter, but form a pronounced forward sinus. In some examples, again, the ribbing up to a diameter of 3 mm. is flexicostate, close, and apart from the pronounced depression the whorls then form a morphic representation of *Tragolytoceras*. In fact, the inner whorls of Geyer's<sup>2</sup> '*Egoceras*' *adnethicum* (Hauer) seem identical in ribbing, but in still other examples the striation of the flattened ventral area resembles that of the immature '*Arietites varicostatus*' figured (with slight exaggeration on the part of the artist) by the same author,<sup>3</sup> or of young *Paracaloceras*, e.g., *P. coregonense* (J. de C. Sowerby) or *P. centauroïdes* (Savi and Meneghini).<sup>4</sup> The former arietoid species, it may be remembered, was considered by Canavari<sup>5</sup> to be perhaps the root-form of *Microderoceras*, and the writer accepted this formerly when he felt that all was not well with the customary 'laws' of ammonite development, and was puzzled by the presence of an astonishing number of what seemed to be unclassifiable hybrid young in the *birchi*-bed.

Ornamentation in ammonites might almost be compared

<sup>1</sup> Spath, *loc. cit.* ('Gault Monograph,' 1923), p. 9.

<sup>2</sup> *Loc. cit.* (1886), p. 261, Pl. IV., fig. 3.

<sup>3</sup> *Ibid.*, Pl. III., fig. 4b.

<sup>4</sup> See Wöhner, *Beitr. Pal. Geol. Österr.-Ung.*, Vol. VI. (1888), Pl. XXIV., figs. 1-10.

<sup>5</sup> 'Beiträge z. Fauna d. Unt. Lias v. Spezia.' *Paläontogr.*, Vol. XXIX. (1882), p. 190 (68).

to those prickles or spines that are produced at will on originally succulent leaves under a glass bell. All the different types of ornamentation have already been tried by Palæozoic and Triassic stocks, from the Devonian Clymenids onwards. Again and again we find that in comparison with the dominant and persisting smooth radicals the ephemeral ornamented forms, like Suess's original *Ammonites*,<sup>1</sup> were merely 'les autres.' Of course we must not confuse the primitive rounded venter and smoothness of, e.g., *Lissoceras* and *Haploceras* with the secondary loss of keel or ornament in other Oppelids. Like the crowding and reduction of the few terminal septal edges, observed in many ammonites, this is a phenomenon of individual growth and cannot be applied to phylogeny. If some peculiarity of the adult suture-line does not enable us to recognise the true affinities of a given ornamented form we cannot really classify it with more confidence than, e.g., a desert-leaf by itself. But it is only a matter of systematic detail whether we recognise merely one genus *Oppelia*, Waagen (Wepfer, 1911), or whether we include the fifty or more genera now known in a super-family Oppelida. They cannot, of course, be traced back to a single group of *Phylloceras*; and the second dominant Jurassic super-family Stephanoceratida is similarly adopted only because probable derivation of its branches from various groups of Lytoceratids accounts for a constant recurrence of more or less homæomorphous types.

The suture-lines of the Hettangian Alsatitids are instructive because they show—as do such widely distinct stocks as Ectocentritidæ and Baculitidæ—how on the reduction or modification of the original Lytoceratid suture-line, the internal and umbilical lobes change. The mechanical adjustment of the suture-line to different whorl-shapes was investigated by Pfaff,<sup>2</sup> and discussed by the writer on a previous occasion.<sup>3</sup> I remarked that development or loss of strengthening ornament (corrugation or keels and furrows) on the shell would affect the suture-line as much as change of whorl-shape. Since modification is slow, the value of the suture-line for systematic purposes is not impaired. If in, e.g., *Pictonia 'cymadoce'* the ornament is more reduced than the suture-line in one specimen, and, in another, the suture-line more than the ornament, no practical difficulty arises. To create species in this or the similar gens of *Proplanulites königi* (J. Sowerby) is unjustifiable, and in the case of v. Koenen's fifty-six 'species' of *Platylenticeras* it could not even be claimed that they might be characteristic of different horizons.

<sup>1</sup> See Spath, *Geol. Mag.*, 1924, p.89.

<sup>2</sup> 'Form und Bau der Ammoniten-Septen, etc.' *Jahresb. Niedersächs. Geol. Ver.*, Vol. IV. (1911), pp. 221-2.

<sup>3</sup> *Geol. Mag.*, 1919, pp. 28-32.

That the Lytoceratid suture-line is not a reduced one, as held by Schindewolf,<sup>1</sup> is shown by the persistence and flourishing condition of the family Lytoceratidæ throughout the Jurassic, and the distinctness of involute Lytoceratids from convergent evolute Phylloceratids. The possibilities of mutation are quickly exhausted in reduced stocks. Schindewolf's just objections to the assumption of complete restoration in a stock of all the characters previously lost in simplification may well be applied to those mysterious 'small members' that have been held to start new families. The importance of the evidence of the reduced suture-lines in these 'degenerate' stocks cannot be over-rated.

It is clear that a simple application of the biogenetic law to *Gagaticeras* would lead to results as absurd as in the case of a new-born monkey. To add to our overwhelming detail, whilst there may be pronounced raricostation throughout several depressed whorls of young *Gagaticeras* already at a diameter of a few millimetres, in other immature specimens there is not only fine and close costation, but the whorls are round or even compressed at smaller diameters. The great instability of these inner whorls may yield impressive results to the compass- and graph-enthusiast; they are as futile as those obtained by measuring parts of the suture line. The larger whorls are almost indistinguishable. It seems to the writer reasonable to assume that the young were very sensitive to their environment, *e.g.*, food supply, depth of water, etc.; as in many modern shells corrugation and other ornamentation are merely indications of the nature of the particular water in which the animals lived. Whilst we should not hesitate to identify—specifically—all the adults, ontogenetic peculiarities, such as variations in whorl-shape, might be adduced to justify the assumption of most diverse phylogenies and skipping of hypothetical stages. I have myself confidently used (and later reluctantly retracted) such recapitulational evidence,<sup>2</sup> before I discovered that new characters first appear in the young, but the two instances quoted by Dr. Trueman and Miss Williams<sup>3</sup> are in a different category. For *Pseudosaynella rarisulcata* (Leymerie) remains small and desmoceratid, whilst the large *Pararnioceras* examined were merely fragments of outer whorls. Also if we come upon exceptional Gault Hoplitids in which the inner whorls to a very late stage resemble *Beudanticeras*, this merely shows their common origin. It is clear that for accurate comparison with other

<sup>1</sup> 'Entwurf einer Systematik der Perisphincten.' *N. J. f. Min., etc., Beil. Bd.*, LII., B., 1925, p. 342.

<sup>2</sup> 'On the Development of *Tragophylloceras Loscombi*,' *Quart. Journ. Geol. Soc.*, Vol. LXX. (1914), pp. 336-362, Pls. XLVIII.-L.

<sup>3</sup> *Loc. cit.* (1925), p. 700.

genera the inner or adolescent whorls of given ammonites also should be known. There may be siphonal spines on the outer whorls of a *Gymnites* and costæ on the inner whorls of a similar *Psiloceras*, and we need only recall in this connection the young of *Paracaloceras*, of *Asteroceras stellare* (see p. 268), in which the tubercles are perhaps a mere strengthening device, as in *Gastrioceras*,<sup>1</sup> and of the Schlotheimids.<sup>2</sup> The adult suture-line, however, remains the most important character, changing slowly even with whorl-shape, and we also see now why Branco's brilliant researches of nearly half a century ago on the initial stages of ammonoids have not resulted in a satisfactory classification.

The use of small families seems advisable for reasons of systematic convenience and a better general view of a multitude of units, but it is doubtful whether it will ever be possible to restrict the smaller families to the descendants of definite species-groups within the Phylloceratids and Lytoceratids—considering the incompleteness of the geological record. In any case we cannot at present hope to connect any particular species of *Gagaticeras* or other Echioceratids, or of *Paracaloceras* and Alsatitids, with definite forms of *Tragolytoceras*, *Ægolytoceras*, *Lytotropites*, *Pleuracanthites*, or any other of those Mediterranean transitional types that bridge the gap between Lytoceratids and the various branches of the polyphyletic Ammonitida. Similarly the second great Lower Liassic super-family of Deroceratida is polyphyletic, and was likewise replenished repeatedly from a Lytoceratid root-stock. But it is as yet doubtful whether we can insist on numerous such Lytoceratid offshoots within each of the Xipheroceratidæ, Deroceratidæ and Microceratidæ that seem so closely connected, and we may even link them up with the incompletely known Liparoceratidæ and Paltopleuroceratidæ; but Polymorphidæ, with genera like *Gemmellaroceras*, almost certainly include independent ('cryptogenetic') developments, as do Amaltheidæ, with, e.g., *Amphiceras* (ex *Tragophylloceras*). Similarly *Prodactylioceras* and the simplified Dactylioceratids, though apparently connected *via* *Cæloceras* and *Cæloderoceras* with *Epideroceras*, probably represent an independent *Lytoceras* offshoot, as Salfeld and Frebold maintain; but the connection of all these genera, even if indirect, with the fundamental stocks is clearly indicated.

(To be continued).

<sup>1</sup> H. Schmidt: 'Neotenie und beschleunigte Entwicklung bei Ammonen,' *Pal. Zeitschr.*, Vol. VII., 3, 1925, p. 202.

<sup>2</sup> Spath, 1924 (*Proc. Geol. Assoc.*), p. 198.

## THE WATER VOLE IN RELATION TO PRE-HISTORIC MAN.

FREDK. J. STUBBS.

IN October, 1925, during the opening of a prehistoric barrow at Dow Low, near Buxton, Mr. J. Armitage noticed a quantity of small bones; and, knowing that the common Brown Rat is too recent an alien to be found in barrows, he sent me a few skulls with the query 'Are these the Old English Black Rat, *Mus rattus*?' The Black Rat, however, is also an alien, with no evidence that it was present in England before the pre-historic period.

The skulls sent were those of the Water Vole (*Microtus amphibius*), an animal which has frequently been found in barrows. The problem of their presence has often been discussed, and several explanations offered. Judging from a recent text book (Prof. Bertram Windle's 'Remains of the Prehistoric Age'), the current opinion is that the animals are mere necrophiles, attracted to the newly-formed barrow by the prospect of food; and, alternatively, it is suggested that the Voles have used the barrow as a place of hibernation.

A field naturalist cannot accept either of these explanations. There is no evidence whatever that the Water Vole hibernates; on the contrary, the animals are often seen in the middle of winter. So far as my own experience goes, the Water Vole is strictly vegetarian. All the old standard writers on British mammals refuse to admit that it is ever carnivorous. The late Major Barrett Hamilton, however, in his 'History of British Mammals' (the part dealing with the Water Vole was published in 1914), while describing the animal as a vegetarian, went to great trouble to collect every record of cases where the Vole has been known to eat dead fish, molluscs, or insects. I have known cases where the Field Vole and the Rabbit have been carnivorous, and there is nothing impossible in the idea of an occasional abnormal Water Vole adopting, for a single meal, a flesh diet; nevertheless, we shall be not far wrong in saying that the Water Vole is a vegetarian.

The presence of Water Voles in hundreds—or perhaps even in thousands—in a single barrow has no parallel with anything we know of the habits of the animal to-day. It is not usually a gregarious animal forming strong colonies; family parties are as much as we expect to see. In order to leave even a hundred skulls in a single cairn, it would be necessary for the spot to be occupied by a colony of thousands during a protracted period. Moreover, similar ossuaries would be found to-day during such operations as ditching or excavating in localities haunted by Water Voles. I have never heard of any

such instance, nor is the matter mentioned in any work on British mammals. These great deposits of Voles' bones are known only in prehistoric barrows of a particular type.

It is a matter of surprise that Barrett Hamilton overlooked the copious literature relating to the Water Vole from the archæological standpoint. His opinion on the problem would have been invaluable; and I take the liberty of doubting if he would have agreed with the archæologists that these Water Voles were either necrophagous or hibernating invaders of the barrows. The only authoritative word by a zoologist is Professor Rolleston's explanation (see p. 795 of Greenwell's 'British Barrows') that the barrow had been used as the lair of a Polecat which had, in the usual musteline manner, sucked the brains of the Voles after carrying them underground. The field naturalist will hesitate before accepting this explanation for every barrow where Voles' bones have been found.

There is no doubt that the matter has not received the attention it deserves, and I wish to suggest lines of further enquiry. Many explorers of barrows treat these 'rats' bones,' to use the erroneous term often met with in archæological writings, as negligible and even contemptible. It is therefore hard to learn if any particular barrow has, or has not, contained Vole remains. I find references, more or less definite, relating to Normandy, South Germany, and Denmark; in the latter country Herr Winge seems to doubt the age of the remains.\* The Water Vole does not occur in Ireland. In Great Britain the records seem thinly distributed everywhere, except in Derbyshire and Staffordshire. Here the general opinion is that 'rats' bones' are 'invariably present.'

Thomas Bateman's 'Ten Years' Diggings' (chiefly in Derbyshire) contains at least eighty definite records of 'rats' bones,' sometimes in vast quantities, in barrows opened by that excavator. His own opinion was that the animals had simply burrowed into the fresh mound to feed on the corpse. A naturalist studying Bateman's records came quite obviously to the conclusion that prehistoric man embalmed the corpse with arsenic—still the favourite preservative of the vertebrate naturalist—and that the Voles fell dead the moment they began to attack the remains. There can be no other conclusion *if we accept* Bateman's opinion, for neither Voles nor any other British mammals creep into great communal chambers when they feel their ends approaching: but Bateman's opinion is far from being acceptable, and the arsenic idea must be dismissed.

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\* Herlug Winge, 'Jordfundne Pattedyr,' *Videns Medd. Nat. Forening.* (Copenhagen), 1904, pp. 221-2; at Caen, *cf. Mem. Soc. des Ant. Normandie*, 1831-3, p. 282; and L. Jewitt, 'Grave Mounds,' p. 16.

Canon Greenwell, as industrious as Bateman, and a far more sagacious observer, seldom noticed the remains of Water Voles in the Yorkshire barrows which he opened; in fact, they were positively absent from most of the mounds. He describes, however, a Westmorland example, and this passage ('British Barrows,' page 391) may be quoted as a good description which possibly applies to all cases.

'The whole of the mound was full of broken and scattered human bones, of which those of an adult and a child can be identified, together with many bones of ox and goat. At the centre, and laid on the natural surface, was the burnt body of an adult woman, and immediately overlying the calcined bones, and in contact with them, were the unburnt bodies of two infants. All around and over these bodies were the bones of Water Voles in hundreds—so numerous, indeed, were they that at the point indicated the material of the cairn seemed almost to consist entirely of them. Amongst them was the head of a foomart (*Mustela putorius*), the lower and part of the upper jaw of a cat, probably the wild species, and half the lower jaw of a large dog, and the same of a goat.'

We know that all these skulls were smashed, the hinder part of the braincase missing, from Professor Rolleston's note on page 735 of the same volume. I gather that all micro-mammalian skulls are imperfect, no matter how they lie in prehistoric deposits. Many years ago, when Cuvier examined the skulls of Water Voles found in the Kirkdale Cavern, he regretted that owing to the absence of calvarium it was impossible for him to say whether these animals were *Microtus amphibius*, or the closely allied *M. terrestris*. The latter animal, hitherto unknown in England, is common on the Continent, and it differs chiefly from the Water Vole in its strictly terrestrial habits. The possibility mentioned by Cuvier must be borne in mind; these barrow Voles perhaps may not be *M. amphibius*, but *M. terrestris*. Where Cuvier failed I do not care to intrude. In my opinion there are faint differences between these Buxton remains and the skulls of recent Water Voles. For the present this is a minor point, except with regard to the detail of these skulls being so consistently damaged.

Bateman makes one observation ('Ten Years' Diggings,' p. 60) which disposes of the necrophagous or hibernation theory:—

'The urn,' he writes, 'is ornamented by patterns from a twisted thing, and is in fine preservation, having been found perfect. The bones within were beautifully coloured by burning; amongst them we found a piece of an animal's jaw, rats' bones, a fine bone pin, a fragment of thin pottery, a flint arrow head, all (including the rats' bones) much burnt.'

The presence of partially burnt human bones in the sand, the discoloration of the latter, and the occurrence of calcined rats' bones in the urn, demonstrate the fact of the corpse having been consumed upon the spot.'

Another remarkable passage (page 73) describes how he found the bones of an aged man, the cranium carefully placed in the middle of the heap of bones, the long bones laid parallel with each other, and the skull upside down. 'The bones being perfect,' he says, 'it is evident that this arrangement had been made while they were fresh and strong . . . a similar mode of interment exists amongst the Patagonians, who make skeletons of their dead previous to burial . . . Great quantities of rats' bones were found through the whole of the excavation, but they were best preserved and most abundant around the second interment.'

This is ambiguous, and it is not clear whether the rats' bones occurred in close association with the skeleton, as the barrow contained at least three bodies. Bateman, like most other explorers, notices in his barrows the remains of many large animals and such small creatures as 'birds,' a hawk, a fish, weasels, and shells. Shells of *Helix* (probably *H. nemoralis*) are extremely abundant in these Derbyshire barrows, occurring with the 'rats' bones.' It has been clearly demonstrated, at least so far as Wiltshire barrows are concerned, that these shells must have been deposited during the building of the mounds, either 'for food,' or 'from some strange superstition' (cf. Thurnam, *Archæologia*, 1871, p. 541; and *Wilts. Arch. Mag.*, 3, p. 185.).

After careful examination of the 28 skulls sent by Mr. Armitage, I am not sure that the damage in every case is to be ascribed to decay in soil, for in some of the skulls the fragile bones in the nasal region are intact, while the far stronger calvarium is broken and missing. As already pointed out, most, if not all, of the skulls of the micro-mammalia found in prehistoric deposits, especially caves, are incomplete. Many years ago, being rather interested in this subject, I concluded that such remains came from pellets cast up by owls which had used the caves as sleeping places, for in hollow trees and in barns I have often found tremendous deposits of owls' pellets (the accumulation of many years) rich in damaged skulls of rats, mice, voles, shrews, etc. Of course there can be no idea of owls' pellets in barrows; and more recently I find that this pellet theory is not always tenable where cave deposits are concerned. At any rate, there seems to be some connexion between prehistoric man and smashed skulls of micro-mammals.

(To be continued).

## IMPATIENS GLANDULIFERA AND OTHER ADVENTIVE PLANTS IN BRITAIN.

G. CLARIDGE DRUCE, D.SC., LL.D.

OPINIONS have often been expressed regarding the advisability of including adventive species in our British Floras. The late J. Britten, in his early days, was zealous in recording alien plants, but in more recent years threw scorn upon recording them or the various wool-aliens which from time to time were found on the 'inexhaustible rubbish-heaps of Tweedside.'

But these and similar aliens, such as *Sempervivum tectorum*, *Centaurea Solstitialis*, *Populus alba*, *Lepidium* *Draba* and *Hypericum barbatum* were described and figured by Smith in the first edition of English Botany, and are still included in Bentham's Handbook, Babington's Manual and the London Catalogue.

In the Cambridge British Flora, *Populus alba*, *Salix babylonica* and *S. daphnoides* are included, but in this work they are relegated to their true grade of citizenship. Something like consistency of treatment should be adopted, to pick and choose at random leads to confusion. The inclusion of alien species is consistently, if not exhaustively, adopted in Ascherson and Graebner's Synopsis, where the most popular plants in cultivation are mentioned, but are so treated as to allow no mistaking their alien character. This gives the botanical student a better idea of Taxonomic Botany, and saves many mistakes in identification, as the student is apt to fix a foreign plant to a description in his own text-book. Once I had six plants sent to me from the Riviera, which the sender could not find in Grenier and Godron's 'Flore de France.' One had wrongly been identified as *Hyoscyamus albus*, but it is not likely that a beginner should know that not one was a native species of France, although prominent objects in the gardens and in semi-wild places on the Litoral. These included *Wiganda*, *Solanum glaucum*, *Mesembryanthemum edule* and *Erigeron mucronatum*.

It is a great advantage to have the more prominent species, especially trees and shrubs, which are planted in wild-looking places, recorded so long as the true facts about them are given and their correct status is supplied. It would have been an immense gain if the early date of a plant-introduction was accurately known; many plants which now masquerade as native species would be relegated to their proper grade.

When one begins to pick and choose between rival claimants, difficulties begin, and sometimes ludicrous results follow; for instance, in the last edition of the London

Catalogue, three grades of citizenship are given : (1) true native ; (2) probably or certainly not aboriginal (native), but more or less well established ; (3) casual or planted alien. *Calla palustris*, which has no claims to be a British plant, since we know by whom and when it was planted in its Surrey locality, is given the second grade ; yet *Aquilegia alpina*, which grows on rocks in Caenlochan Glen, Forfar, is omitted, though we do not know when or by whom its seeds were sown or, indeed, whether seeds of the Larkspur were ever sown there. *Pinus Pinaster* is in the same grade, and its introduction is pretty well known, but *Larix* is omitted ; yet it outnumbers the *Pinus* by hundreds of thousands ; nor is *Populus serotina* given, although probably no British county south of Caithness is without it ; while *P. nigra* is given the first grade and *P. alba* the third. *Pyrus* (*Sorbus*) *domestica* is honoured by the second grade on the faith of a solitary tree in Wyre Forest (doubtless a planted specimen), which was burned down by some mischievous boys in 1862, and the name, if included at all, should have been enclosed in brackets. *Salix daphnoides*, also an introduced species, is in grade one, but enclosed in brackets, although it is quite plentiful in Staffordshire and other places. Another planted tree, *Alnus incana*, is in the second grade, but the *Fuchsia*, so abundant in Ireland, and *Erica lusitanica*, self-sown and spreading in Dorset, are absent. Again, such rubbish-heap aliens as *Urtica pilulifera* var. *Dodartii*, which probably no living person has seen in Britain, the South American *Chenopodium Berlandieri* and *Rumex obovatus* (the common American *salicifolius* is omitted), the South American *Chenopodium hircinum* are given as native species. *Siler trilobum*, formerly found as an introduced species in a hedge near Cambridge, has not been seen there for over twenty years—it might have been bracketted or omitted—and *Kentranthus Calcitrapa*, which once grew on a garden wall at Eltham in Kent, might have shared the fate of *Trachelium* (which still grows in such a place in Guernsey) and been omitted. Other plants given as natives are *Silene conoidea*,\* *Sisyrinchium californicum*, neither of which can seriously be claimed as natives of the British Isles. The American *Polygonum sagittatum*, which has been perfectly naturalised in Kerry for a longer period, is only given the third grade. This criticism might be extended to a great length, and many will be able to add other examples.

Sir Joseph Hooker once said he knew of no plant becoming thoroughly established in Britain during the last century, but

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\* The plate in 'Cambridge British Flora' of *S. conoidea* suggests to me that a form of *S. conica* has been mistaken for it. I have never seen *conoidea* in Jersey other than as a very rare rubbish-heap casual.

surely Homer was nodding, since we have examples in *Veronica Tournefortii*, *Elodea*, *Mimulus guttatus*, *Coronopus didymus*, *Sisymbrium altissimum*, *Lepidium Draba*, *Crepis taraxacifolia*, *Senecio squalidus*, *Matricaria suaveolens*, *Sagittaria heterophylla*, *Lupinus Nootkatensis*, *Impatiens parvifolia*, *I. fulva* and *I. glandulifera* among other species which are now completely naturalised.

Of some of these we know pretty well the date of their appearance. Of others the precise date is lacking. Of the above established aliens, what botanist, when the earliest record was made, could have dreamed of its rapid and complete naturalisation? Therefore, I like to record any alien species which may be sent to me, as one cannot predict which will survive. Of all the 350 Tweedside aliens, who would have suspected that the Australian *Rumex Brownii* or the New Zealand *Acaena* (both omitted from the London Catalogue) should be persistently and completely naturalised? Let us take the Himalayan Balsam for example, which is now so abundant by the rivers in Yorkshire and Devon. Whether or not this was the Balsam 'twice as tall as the *Impatiens fulva*, with a stem as thick as a common broom handle,' which Alexander Irvine (Phyt. 166, 1855) was informed grew on the Colne, between Harefield and Denham,' is uncertain. I am inclined to think it was big *fulva*, which does grow there. In 1859 Leo Grindon (Manchester Fl., 99, 1859) says *I. coccinea*, as he called it, 'like its congeners, grows whenever a seed is dropped and rapidly disseminates itself.'

Irvine (Phyt. 544, 1863) thinks the Colne plant may be that species and believes that it may become one of our naturalised plants at no distant period. See also *The Naturalist* ii., 49, 1865. These are not very precise records.

In *The Botanical Magazine*, t. 7647, 1899, under the name *Impatiens Royleii* var. *pallidiflora*, Sir Joseph Hooker figures and describes a variety of this plant, which, he says, appeared for the first time in the shrubberies of his garden near Sunningdale three or four years ago, and rapidly increased so as to become a weed, until 1898.

Mr. Britten (*Journ. Bot.* 50, 1900) says Mr. Dunn found it in Surrey at Chilworth, and that Mr. Burkill has seen it at Scarborough.

It may be added that the var. *pallidiflora* Hook f. is scarcely worthy of varietal rank, and that the name *Royleii* is untenable, as in 1835 it was described and illustrated by Royle as *glandulifera* in his 'Illustrations of Himalayan Plants.' Hiern (*J. of B.*, 87, 1900) gives the first precise record. He says, 'I found this species on September 28, 1888, in Anchor Wood, Framington Parish, North Devon, and in 1892 he found it by a cottage in Alwington parish in the same county. In the

Berkshire Flora of 1897, I recorded it from Padworth Mill, 1894, Aston Ferry by the Thames, and Bagley Wood. In 1899 Carleton Rea found it by the side of a brook at Madresfield, Worcestershire, and C. B. Clarke (*J. of B.*, 1900, 278) says in 1892 'there was a grove of it near the Prebend's Bridge at Durham, high enough to bury a cow.' Travis records it from the Conway, Denbighshire, in 1910. Now it covers many acres by the rivers of South Devon and Cornwall, it occurs at several places on the coast of North Wales; this year Sir Roger Curtis and I found it in great quantity in meadows near Trysall, Staffordshire. Its abundance and beauty in the river near York is well known to most of your readers. That it will increase its area in the near future is quite certain.

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**The Earth and the Stars**, by C. G. Abbot. London: Chapman & Hall, Ltd., xi.+264 pp., 15/- net. Dr. Abbot is the Director of the Smithsonian Astrophysical Observatory, and has produced this popular account of the heavenly bodies. He also gives information relating to famous Astronomers and famous instruments, the Calendar, Navigation, and so forth. The book is well illustrated, and can be followed quite well by a non-scientific reader.

**Animals of Land and Sea**, by Austin H. Clark. London: Chapman & Hall, Ltd., xxxiv.+276 pp., 15/- net. A companion to the preceding volume is also by a member of the staff at the Smithsonian Institution, and in this case deals with various sections of the animal kingdom which are usually neglected in popular books, among the chapters being: Biology and Human Welfare; Animal Names; Man's Place in the Web of Life; Man's Chief Competitors, The Insects; Animal Flight; The Deep Sea Animals. Here again the wealth of illustration alone will considerably assist in selling what will certainly prove to be a popular book.

**Evolution**, by J. Graham Kerr. London: Macmillan & Co., x.+278 pp., 12/- net. An excellent coloured plate illustrating mimicry in butterflies forming the frontispiece, strikes the key-note of Mr. Graham Kerr's well-illustrated and well-printed volume. In the fifteen chapters the author gives an account of Embryology; Palæontology; Comparative Anatomy; The Distribution of Animals, and General Conclusion as to the Fact of Evolution; Heredity; The Cytological Basis of Inheritance; The Statistical Study of Inheritance, and similar subjects. The chapters on Communal Evolution and Evolution and Man are probably of more general interest, and will appeal to many besides zoologists.

**Bibliography of American Natural History**, by Max Meisel. New York: The Premier Publishing Co., 626 Broadway, Brooklyn, 244 pp., 5 dollars. The author deals with the role played by the Scientific Societies, Scientific Journals, Natural History Museums and Botanic Gardens, State Geological and Natural History Surveys, Federal Exploring Expeditions in the Rise and Progress of American Botany, Geology, Mineralogy, Palæontology and Zoology; and there is an Annotated Bibliography of the Publications Relating to the History, Biography, and Bibliography of American Natural History and its Institutions during Colonial Times and the Pioneer Century, which have been published up to 1924; with a Classified Subject and Geographic Index; and a Bibliography of Biographies. Our American friends are certainly go-ahead in the way of Bibliographies, and there is no doubt the present one will prove of considerable assistance to the scientific worker.

## YORKSHIRE ENTOMOLOGICAL NOTES FOR 1925.

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 W. D. HINCKS AND J. R. DIBB.
 

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OUR first capture of the year was a single specimen of the Staphylinid beetle, *Tachinus subterraneus*, taken by shaking débris in Roundhay Park (J.R.D.). We have taken this species in fair numbers in the Leeds district recently, usually in rotting turnips.

In February a visit to Doncaster yielded, among others, the following beetles: *Pterostichus versicolor*, *Halyzia 18-guttata* and *Carphophilus 6-pustulatus* (W.D.H.). We have previously taken the last in some numbers under the bark of a fallen tree at Eccup (30/3/23). But on re-visiting the locality in 1925 we found the tree had been removed, and up to the present we have been unable to re-discover this rare species.

The only insects worthy of note taken in March were three specimens of the rare Syrphid, *Melangyna 4-maculata*, from tree trunks at Blackmoor, near Leeds (W.D.H.). The early appearance of this fly may account for the paucity of records, it being but once before noted from Yorkshire.

In April we visited Askham Bog, and took the following beetles: *Agabus abbreviatus* in some numbers, *Rhantus exoletus*, *Helophorus arvernicus*, *Hydrena nigrita*, *Philhydrus nigricans*, *Noterus clavicornis* (in abundance), and several species of *Halipus*, the members of which genus we have found very abundant during the year.

*Mysia oblongo-guttata* was very common and very variable on pines at Blackmoor during this month.

June, as usual, proved to be very favourable for insects.

At Askham Bog we took *Chilicorus similis* (W.D.H.), *Donacia limbata*, *sericea* and *simplex* in abundance (J.R.D.); and of the Diptera, *Helophilus hybridus* and *lineatus* (W.D.H.), *Lipara lucens*, gall on *Arundo phragmites*, *Pachyrrhina crocata*, common (W.D.H.), *Tæniorrhynchus richiardii* (W.D.H.), *Anopheles plumbeus* and *Cordyula umbrosa* (W.D.H.). This latter insect is new to the Yorkshire List.

During this month three specimens of *Hylobius abietis* were attracted to light (J.R.D.).

At Seacroft, near Leeds, we took the fly *Thereva nobilitata*, and the uncommon wood-boring beetle *Ptilinus pectinicornis* in abundance. In Roundhay Park a single *Beris fuscipes* occurred. At Poole, in July, a single specimen of *Malthodes atomus* was taken by sweeping rank herbage on the banks of the Wharfe (W.D.H.). The same day, in the Washburn, at Leathley, the common *Platambus maculatus* occurred in some numbers (W.D.H.), but only one specimen of the type was taken, all the rest having the elytral markings more

or less atrophised, and one specimen was the var. *immaculatus* Donis.

A visit to our favourite hunting ground at Blackmoor during this month was disappointing, for, beyond an unusual abundance of the common species of *Malthodes* and *Malthinus*, very little was taken. *Beris clavipes* was the only fly worthy of note (W.D.H.). This is the second Yorkshire record for this species.

In August we again visited Blackmoor, and did a little better than on the occasion of our former visit. Whilst sweeping, at sunset, under pines, one of us (W.D.H.) captured what appeared to be two specimens of a *Malthinus*. On arriving home we discovered that one of the specimens was a species of *Bracon* (*Hymenoptera*), a perfect mimic of the beetle. It is possible that the *Braconid* is parasitic on the beetle (*Malthinus frontalis*) at some stage of its existence.

Later in the month a single specimen of the rare Longicorn *Monochamus sartor* was captured (J.R.D.) in a garden. Fowler (*Brit. Col.*) says it is very rare, and probably an importation. Two specimens of the local Dipteron, *Scenopinus fenestralis*, were found on a Leeds shop window (W.D.H.).

In September, *Calandra oryzae*, the grain weevil, was found in great abundance in maize (J.R.D.). This species and its congener *C. granaria* are extremely destructive to cornstuffs.

The following are a few common dragonflies noted by us during the year:—*Sympetrum scoticum* Don., Blackmoor; *Aeschna grandis* and *A. juncea*, Blackmoor; *Pyrrhosoma nymphula*, common; *Agrion puella* and *A. pulchella*, abundant at Askham Bog and elsewhere; *Ischnura elegans*, common; *Enallagma cyathigerum*, Askham Bog.

We append the following list of Coleoptera collected previous to 1925, but only recently determined, and previously unrecorded captures:—

- Miscodera arctica*. Ilkley Moor, 23/9/22, W.D.H.  
*Tetraplatypus similis*. Adel Moor, 29/4/22, W.D.H.  
*Trichocellus cognatus*. Ilkley Moor, 23/9/22, W.D.H.  
*T. placidus*. Shadwell, 1921, W.D.H.  
*Pterostichus vitreus*. Ilkley Moor, 23/9/22, W.D.H.  
*Dromius agilis*. Adel Dam, 1921, W.D.H.  
*Oxyptoda spectabilis*. Roundhay, 12/21, W.D.H.  
*O. lividipennis*. Roundhay Park, 28/3/23, W.D.H.  
*Heterothops binotata*. Leeds, 8/23, W.D.H.  
*Lathrobium geminum*. Leeds, 4/22, W.D.H.  
*Phyllodrepa vilis*. Blackmoor, 26/3/22, W.D.H.  
*Silpha sinuata*. Leeds, 1923, J.R.P.  
*S. tyrolensis* var. *nigrita*. Leeds, 1919, W.D.H.  
*S. dispar*. Leeds, 1923, J.R.D.  
*Agathidium laevigatum*. Blackmoor, 3/23, W.D.H.  
*Cateretes pedicularius*. Leeds, 8/23, W.D.H.  
*Cryptophagus scutellatus*. Leeds, 31/12/24, W.D.H.  
*C. distinguendus*. Harewood, 5/4/23, W.D.H.

- C. acutangulus*. Leeds, 1924, W.D.H.  
*Dacne rufifrons*. Poole, 2/6/22, W.D.H.  
*Corticaria impressa*. Leeds, 1921, W.D.H.  
*Litargus connexus*. Leeds, 12/6/22, W.D.H.  
*Cerylon histerooides*. Eccup, 30/3/23, J.R.D. and W.D.H.  
*Limnius troglodytes* (probably new to Yorks.). Buckden Gyll, 31/7/04,  
 Herr Ostheide (Ex Coll. E. C. Horrell).  
*Riolus subviolaceus*. Buckden, 1/8/04, Herr Ostheide (Ex Coll. E. C.  
 Horrell).  
*Melanotus rufipes*. Blackmoor, 3/5/24, W.D.H.  
*Corymbites æneus*. Weeton, 1922, J.R.D.  
*Athous difformis*. Adel Dam, 1921, W.D.H.  
*Hedobia imperialis*. Leathley, 2/6/23, J.R.D.  
*Cænoptera umbellatarum*. Boston Spa, 6/17, E. C. Horrell.  
*Saperda populnea*. Blackmoor, 1921, W.D.H.  
*Timarcha tenebricosa*. Collingham, 1924, J.R.D.  
*Apion rubens*. Blackmoor, 3/22, W.D.H.  
*Liosoma ovatum* var. *collaris*. King Lane, Leeds, 1921, J.R.D.  
*Pentarthrum huttoni* (probably new to Yorks.). Leeds, 6/23, J.R.D.  
*Hallomenus binotatus*. Leeds, 8/23, J.R.D.

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**Iceland and Greenland Falcons in the 'Zoo.'**—The other week I was very pleased to see a very fine specimen of the rare Iceland Falcon in the gardens of the London Zoological Society. By the data, 'Presented by the Hull Ships Stores, Ltd., on July 20th, 1923,' I hoped it would be a Yorkshire record. Mr. Sheppard has kindly made enquiries for me, and finds that it was caught on board the steamer *Lagarfoss*, two miles out of Reykjavik, Iceland. In the next cage there was the beautiful specimen of the Greenland Falcon that was caught by a boy in Pembrokeshire about three years ago. These birds are in the falcons' cages, quite close to the old refreshment rooms.—H. B. BOOTH.

**A Mole and its Burrow.**—On March 14th, I saw a mole turning over dead leaves in search of food. So long as I stood quite still it did not take any notice, although I was within five feet of it, and I repeatedly swung my stick to draw its attention. Eventually I picked the animal up, and it made many attempts to bite me, and struck very forcibly with its fore paws. It repeatedly made a noise which reminded me of a cork being twisted in a bottle. I then placed it in a bed of pilewort, well away from its hole, and it immediately pushed its head under the roots, and in fifty seconds it had travelled two feet; after this it retraced its steps for one foot and began to travel at right angles at a similar speed. No earth was thrown out during this period, but I could see the roots rising as it travelled along. In pushing into the soil it appeared to get all the thrust from its hind limbs. I found it very difficult to push my fingers under the roots of the same plants.—FRED ALLAN, Greenfield.

## REVIEWS AND BOOK NOTICES.

**The Jungle Behind Bars**, by **Courtney Ryley Cooper**. London : Herbert Jenkins, Ltd., 311 pp., 2/6 net. The author deals with the more popular animals kept in captivity. He gives some fascinating stories of the taming of wild animals, the Gorilla's Revenge, the Lion with the Crooked Brain, and so on.

**Microscopy in the Service of Man**, by **Robert M. Neill**. London : Williams & Norgate, 256 pp., 2/6 net. In this handy little volume the readers will find a practical guide to the study and use of the microscope, and particular reference to the ways in which that instrument can be put to the services of mankind.

**The Meadows**, by **John C. Van Dyke** (of Rutgers University) London : Charles Scribner's Sons, 245 pp., 9/-. As a secondary title the author calls this work 'Familiar Studies of the Commonplace.' He describes the more interesting life of the Raritan Valley, and intersperses his work with poems, etc. The book is well written.

**History of Protozoology**, by **F. J. Cole**. London : University of London Press, 64 pp., 3/- net. Dr. Cole delivered two lectures on this subject before the University of London at King's College a year ago, and they are now printed in a form which will be welcomed by students of this interesting subject. There are illustrations of Antoni van Leeuwenhoek and Emile Francois Maupas.

**Nature from the Highways**, by **H. Mortimer Batten**. London : Herbert Jenkins, Limited, 312 pp., 7/6 net. This is a miscellaneous series of essays written by a well-known contributor to Natural History. Illustrated principally by photographs of bird life, and combining to make a readable and attractive volume, there are forty-two chapters dealing with The Falcon's Crag ; The Weasel in the Hedge ; Reynard as a Fisherman ; Young Hedgehogs and the Cannibal, etc.

**Save Australia**. London : Macmillan & Co., Ltd., 231 pp., 8/6 net. Probably few areas have been affected so much in recent years with regard to its Fauna and Flora as has Australia. The present book is a plea for the right use of the Flora and Fauna, by various writers, and has been edited by Sir James Barrett, who gives some remarkable facts relating to the disappearing animals and plants of that Continent. The volume is well illustrated.

**Animal Life in Field and Garden**, by **Jean Henri Fabre**. London : Thornton Butterworth, Ltd., 318 pp., 7/6 net. Here we have another volume from one of our greatest writers on Natural History, whose fascinating style has frequently been commented upon in these columns. We merely draw attention to the fact that the volume has appeared, knowing full well that its success is assured. There are sixteen of the weird engravings upon wood, by E. F. Daglish, F.Z.S.

**Palæontology : Invertebrate**, by **Henry Woods**. London : Cambridge University Press, 424 pp., 10/6 net. We should like to congratulate Mr. Woods and the Cambridge University Press on the extraordinary success of this useful handbook, the sixth edition having been called for. The recent work of Dr. Spath among the Ammonites, and Dr. Stanley Smith among the Rugose Corals, has resulted in these sections being revised, and in addition further figures have been added to the volume.

**The Gates of the Forest**, by **W. Percival Westell**. London : The Religious Tract Society, 143 pp., 5/- net. In this the author tells us his usual stories of the charm of the Woods, the Snowdrop, the Coming of the Daisy, the Pale Primrose, and so on. The book is typically Westellian. Some of the papers have previously appeared in *The Christian Science Monitor*, *Millgate Monthly*, and other 'hospitable columns.' There are four good coloured plates, but the book cannot be called dear at 5/-.

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T. SHEPPARD, M.Sc., F.G.S.

EVER since 1884 the readers of *The Naturalist* have regularly had placed before them particulars of the various books and articles printed in various societies' Transactions, Journals, Magazines and privately-printed pamphlets, relating to the Geology of the North of England—that is to say, Cheshire, Derbyshire, Nottinghamshire, Lincolnshire and the counties to the north thereof. Formerly (1884-1892) these were compiled by Dr. A. Harker, now a Fellow of the Royal Society, and a native of Hull.

From 1893 onward, at the original suggestion of the then editor of *The Naturalist*, the late W. Denison Roebuck, the duty has fallen upon my shoulders, and to my astonishment I find that for *thirty-three years* I have been responsible for keeping our readers in touch with current geological literature.

In 1914, as Volume XVIII. of *The Proceedings of the Yorkshire Geological Society*, I prepared a Bibliography of Yorkshire Geology, A.D. 1534-1914 (666 pages), which contained something like 6666 references to papers bearing upon the geology of the county for that period. Since that date the Yorkshire Geological Society has, as frequently as its Proceedings have appeared, published the Yorkshire sections of the Bibliographies.

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(To be continued.)

## VERTEBRATE ZOOLOGY IN YORKSHIRE.

E. WILFRED TAYLOR.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists' Union was held at Leeds on Saturday, February 20th, Mr. F. H. Edmondson presiding. The sectional meeting was preceded by a meeting of the Yorkshire Wild Birds and Eggs Protection Acts Committee, Mr. W. H. St. Quintin occupying the chair.

Mr. H. B. Booth reported that large flocks of geese had been seen in various parts of the county. Mr. C. F. Procter commented on the unusual number of the Pink-footed Goose in the Humber district, recorded the visit of a Seal to the Alexandra Dock, Hull, and the shooting of a Hen Harrier on the Humber side.

Mr. F. Stubbs exhibited a melanic specimen of the Common Shrew, and mentioned that only one such example was recorded in Barrett Hamilton's 'British Mammals.'

Mr. Stubbs then read a paper on 'The Water Vole in relation to Prehistoric Man,' which will appear in *The Naturalist*.

A lively discussion followed, in which Messrs. E. W. Wade, F. H. Edmondson, H. B. Booth, and T. Throup joined. The general opinion was that the presence of the remains of voles in such quantities could not be explained by natural means; Mr. Gregory alone thought that further investigation was necessary, and that the remains might have accumulated without human intervention.

A paper was then read by Mr. Riley Fortune entitled 'Some Notes on the Farne Islands.' He referred to his earliest recollections of the islands at a time when the birds were only afforded nominal protection, and to a more recent time when the protection was much more thorough, but parties were allowed to visit the islands and were rowed across in open boats. The advent of the motor boat allowed many more crossings to be made in a given time, and in consequence large numbers of visitors were frequently present in the islands simultaneously, and not only were the birds prevented from attending to their eggs and young, but considerable destruction resulted from inexperienced visitors treading on the nests.

The lecturer drew attention to this state of things in *Country Life*, and suggested that the islands should be closed to the general public; since then they have been purchased by the 'Natural Trust,' and many who have long enjoyed photographic privileges are at present unable to obtain their renewal.

Several photographs were shown illustrating the natural features and the bird life of the islands. The former included St. Cuthbert's Church, Prior Castle's Tower, and the lighthouse from which Grace Darling set out; the latter the numerous species of birds which nest on the islands.

The curious migrations of the Tern Colonies from Knox's Reef to the Brownsman and thence to the Longstone were dealt with, and also the way in which the Arctic Tern has decreased in numbers simultaneously with an increase in the numbers of the Common Tern. About eight pairs of Roseate Terns still nest, and the colony of Sandwich Terns is still one of the main attractions, especially when the eggs have hatched and the young formed themselves into large flocks. Efforts to introduce the Lesser Tern have not been successful.

The Gulls nested round the outskirts of the Tern colonies, and did not dare to cross and run the gauntlet of the enraged Terns; the lecturer thought the large number of deserted nests of the Eider Duck among those of the Terns due to the ducks having been frightened from their nests and not having been allowed to proceed back by the Terns.

A fine series of slides was shown of the remarkable Pinnacle Rocks

with their densely packed Guillemot population, among which several of the Ring-eyed variety could be seen.

The Cormorants nested chiefly on the Megstone, where the eggs were continually raided by the Lesser Black-backed Gulls. The Cormorants did great damage to the valuable Tay Fisheries, which was not surprising when one knew that a single bird could consume 24 large herrings in a day.

Finally a paper was read by Dr. J. S. Gayner entitled 'Some Books about Birds.' The lecturer stated that in order to understand the knowledge of to-day it was necessary to understand the knowledge of yesterday, and that most books contained little that was new and much that was gleaned from the work of others—hence the 'pathetic unanimity and unanimous inaccuracy' others found. The writings on birds fall naturally into four classes: the first includes references to poetic and religious literature before the time of Aristotle, the second the works of Aristotle and his commentators, dating from 300 B.C. to A.D. 1676 when with the writings of Willoughby and Ray we enter on the golden age of Ornithology. This period includes the works of Gilbert White, Thomas Bewick, and Macgillivray, and lasted until the publication of 'The Origin of Species' in 1859, when we enter the modern period.

The earliest writings on birds enshrine the lore of the hunter and the aspirations of the poet and prophet; the movements of migrations were thus early recognised "Yea, the stork in the heavens knoweth her appointed time, and the turtle (dove) and the crane and the swallow observe the time of their coming.'

Aristotle goes further in describing individual species, and his accurate description of the appearance and habits of the Wryneck was quoted as an example. For fifteen hundred years following, the aim of the naturalist was the study of the works of Aristotle and the Elder Pliny; the works of William Turner and Christopher Merritt marked the Renaissance.

The discovery of the New World in 1492 led at once to the recognition of birds and animals unknown to Aristotle, and caused naturalists to examine for themselves. The Ornithology of Willoughby and Ray appeared in 1678, and was written with a transparent honesty and desire to serve which commends admiration. Not till the time of Linnaeus did the semi-descriptive labels give place to true names, and the edition of *Systema Naturæ*, published in 1758, takes precedence over all others.

Gilbert White's 'Natural History and Antiquities of Selbourne' has won a wide circle of readers outside the ranks of naturalists, and though representing little or no advance, possesses a charm difficult to explain.

In the works of Bewick and Wolf we recognise a new class of books depending chiefly on the beauty of the illustrations. Books such as Nelson's 'Birds of Yorkshire' represent a still later class dealing with the birds of a restricted area, and give of the very best that ornithology has to offer. The important contributions made by the bird photographer must also be mentioned.

Undoubtedly the study of birds contributed very largely to the 'Origin of Species,' which was published in 1859; from that time classification became a serious study of the workings of nature. The works of Charles Darwin and Alfred Russel Wallace mark the commencement of the modern period.

The paper was illustrated throughout with lantern slides from well known ornithological works.

In conclusion, a hearty vote of thanks to the lecturers and the lanternist was proposed by the President.

—: o :—

Sir Arthur Keith will be President of the British Association at Leeds in 1927.

## NEWS FROM THE MAGAZINES.

In *Nature*, No. 2940, Professor A. Smithells has an interesting article on 'The University of London.'

Dr. L. F. Spath has a valuable contribution on 'New Ammonites from the English Chalk' to *The Geological Magazine*, No. 740.

H. L. Chibber and L. Dudley Stamp suggest the word Torolite for certain concretionary forms in *The Geological Magazine*, No. 740.

H. P. Lewis and W. J. Rees write on 'Some Grindstones from the Coal Measures of Yorkshire' in *The Geological Magazine*, No. 739.

Miss J. M. M. Dingwall writes 'On *Cyathoclisia*, a New Genus of Carboniferous Coral' in the *Quarterly Journal of the Geological Society*, No. 325.

In *Nature*, No. 2942, Mr. J. Edmund Clark writes on 'International Phenology,' and gives a suggested Phenological Schedule for International Observations.

In *The Geological Magazine* for April, Mr. J. D. Kendall has an instructive essay on 'The Formation of Rock Basins,' basing his observations on the Lake District.

Mr. Horace Donisthorpe favours us with a reprint of his notes on 'Ants and Myrmecophiles at Bordighera,' which originally appeared in *The Entomologist's Record*.

C. L. Withycombe writes on '*Boreus hyemalis*,' A. Cuthbertson on 'Crane Flies,' and H. F. Barnes on 'An undescribed Mushroom-feeding Gall-midge' in *The Entomologist's Monthly Magazine* for April.

*The Hastings and St. Leonards Natural History Society* has issued its *Report and Balance Sheet* for the session 1924-25, from which it would appear that the Society is still doing excellent work, and it certainly has a very substantial membership list.

*British Birds* for April contains an illustrated account of 'Swan-Marks,' by N. C. Ticehurst; a note on the 'Distribution of Guillemots in Great Britain,' by H. F. Witherby; 'The British Birds Marking Scheme,' by the editor, and the usual stock of short notes.

An excellent portrait of the late Prof. W. Bateson, M.A., F.R.S., appears in *The Entomologist* for April, together with a memoir by W. J. Lucas. In the same journal F. J. Killington has some useful notes on Neuroptera taken in 1925. Mr. H. D. Ford also illustrates and describes a white aberration of *Argynnis selene*.

We notice that *Curtice's Botanical Magazine*, recently issued, contains a description of a British plant, *Aconitum anglicum* Stapf, a new species, which the editor creates for a monkshood often grown in English gardens, but also found wild in England. Dr. Stapf has failed to trace it outside England, and is forced to the conclusion that it is truly native.

*The New Phytologist* for March contains the following: 'Mycorrhiza,' by M. C. Rayner; 'Some Observations on *Batrachospermum moniliforme*,' by Kathleen M. Goodwin, B.Sc.; 'Note on a New Form of Electrically Driven Klinostat,' by Edgar Rhodes; and a 'Note on a New Method for the Investigation of Fossil Plants,' by T. M. Harris.

In *The Journal of Conchology* for March are several interesting papers, including '*Limnea pereger* in Swift Streams,' by A. E. Ellis; 'Æstivation of *Helix hortensis*,' by A. K. Lawson; 'Occurrence of *H. aspersa* on Granite,' by C. H. Moore; 'British Marine Mollusca,' by R. Winckworth; 'The Nomenclature of certain British Mollusca,' and 'Description of a new species of *Emarginula*,' by J. D. Dean (with plate).

*The Irish Naturalists' Journal* for March includes 'Notes on the Lesser or Pigmy Shrew,' by C. B. Moffat; 'Irish Plant Associations,' by C. G. Trapnell; 'The Dwarf Spike Rush,' by A. W. Stelfox; 'Rare Plants in Ireland,' by C. D. Chase, etc. It is very distressing to hear that White Abbey, County Antrim, dating back to the thirteenth century, with 'walls 4 feet thick, 30 feet long, 20 feet wide, and 16 feet high, with their three tall windows, have recently been demolished and carted away for building and road-making.'

## NORTHERN NEWS.

The Bowes Museum, Barnard Castle, is to have a small Geological collection from Teesdale and Weardale, and Lord Gainford has offered some specimens gathered by himself as a nucleus.

Under the heading of 'Stone Age Discovery,' details are given of two stone coffins found three feet below the surface in East Lothian. One contained a perfect skeleton with an urn, and the other charred bones. Clearly these cannot be of the Stone Age.

Another of those useful bibliographies of papers on Zoology, Botany, and Prehistoric Archaeology of the British Isles (for 1924) has been prepared by Mr. Sheppard for the British Association. These are invaluable as time-savers for the worker now so handicapped by the enormous output of literature, good, bad, and indifferent.

At the annual meeting of the Hexham Natural History Society and Field Club recently held, there was an exhibition of preserved local mammals and birds to form the nucleus of a museum for Hexham. There were valuable contributions from Mr. Abel Chapman and C. D. Smith. Dr. Ritson has offered to act as honorary curator.

With commendable rapidity the Trustees of the British Museum and the energetic compiler, Mr. C. Davies Sherborn, have issued a still further part of *Index Animalium* (Part IX.), dealing with all the species from *dorsalis* to *Eurystomus*, which were described during the first half of the nineteenth century. This contains 240 pages of closely printed and valuable matter.

Under the heading of 'Un-natural History,' our contemporary, *Punch*, gives the following quotation from a provincial paper: 'Black Combe Mountain, in Cumberland, supposed to be an extinct volcano, was on fire on Saturday. The flames spread over hills and valleys, destroying all vegetation, driving foxes and rabbits to leave their nesting grounds, their eggs being destroyed.'

The Record of Additions to the Hull Museum, *Hull Museum Publications*, No. LXVIII. (1926), is full of interesting items. Bronze Age and Roman remains are well to the fore. A very fine Masonic glass cup, dated 1800, but probably earlier, with a ten-sided stem containing a bubble, is of first importance. A lead weight of the 14th century, the Hunslet gibbet-iron, Wm. Scoresby's compass, a copy of a silver slave brand, and numerous local coins, tickets and badges show the broadness of the curator's activities.

The H.M. Stationery Office continues to issue the practical results of the Investigations of the Ministry of Agriculture and Fisheries with regard to the distribution of fish in the North Sea, and the latest report deals with 'The Distribution of Pelagic Stages of the Cod in the North Sea in 1924 in Relation to the System of Currents,' by Michael Graham and J. N. Carruthers, with a Section on 'The Food of Pelagic Young Cod,' by H. H. Goodchild. The statistics and information given in this report as a result of drift bottle experiments, etc., are of great scientific and economic value, and should be carefully considered by those interested in this important industry.

After describing a flint implement admittedly *picked up on the beach* at Eccles, Norfolk, by Mr. Spilman, who 'picked it up simply on account of its shape, not in the least thinking of prehistoric finds,' Mr. J. Reid Moir has since paid a visit to Eccles, and without a scrap of evidence beyond that given by the finder, says (*Man*, April, p. 72), 'The main facts of the discovery . . . are that a definite flint implement, of Lower Palæolithic Age, has been found at Eccles under conditions making it in the highest degree probable [!] that the specimen was derived from a glacial Boulder Clay, and thus affording further evidence of the existence of Palæolithic Man in England during the glacial period.' As we have said previously, would that some people would Reid Moir and write less.

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PRINCIPALLY FOR THE NORTH OF ENGLAND.

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**T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,**  
*The Museums Hull;*  
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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF  
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## ENTOMOLOGICAL SECTION.

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### EXCURSION TO ALLERTHORPE COMMON, Saturday, June 12th, 1926.

Pocklington buses leave Piccadilly (opposite Tram Sheds), York, at 8-30 a.m., 10 a.m., then every hour until 8 p.m., 9-30 p.m., 11 p.m.

Members joining party after lunch should meet others at Barmby Moor Café at 3 p.m.

#### Programme :—

Morning : Allerthorpe Common.

1-30 p.m. to 3 p.m.—Barmby Moor Café for lunch and to meet afternoon party.

3 p.m. to 7 p.m.—Allerthorpe Common.

7 p.m.—Meeting at Barmby Moor Café for tea and comparison of notes.

W. DOUGLAS HINCKS,

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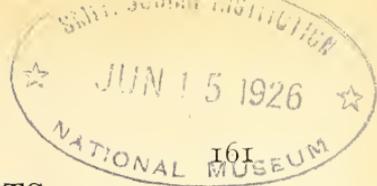
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## NOTES AND COMMENTS.

### SCIENTIFIC NEWS IN THE PRESS.

*Nature*, No. 2940, contains a leading article on 'A British Science News Service,' in which a scheme is suggested for the supplying of reliable accounts of recent scientific research to the press. As is pointed out, 'it is a commonplace that the great majority of newspapers fail to distinguish between science and magic in anything but name, that the space they allot to science, as distinct from sensational charlatanism, is negligible, and that such paragraphs as they do devote to scientific topics are for the most part meaningless and in many cases untrue. The sporadic efforts of a few gifted journalists are not adequate to meet the situation. What is needed is a systematic supply of news, the accuracy of which shall be guaranteed by recognised scientific organisations, while its form renders it easily digestible by at least the better educated newspaper readers.'

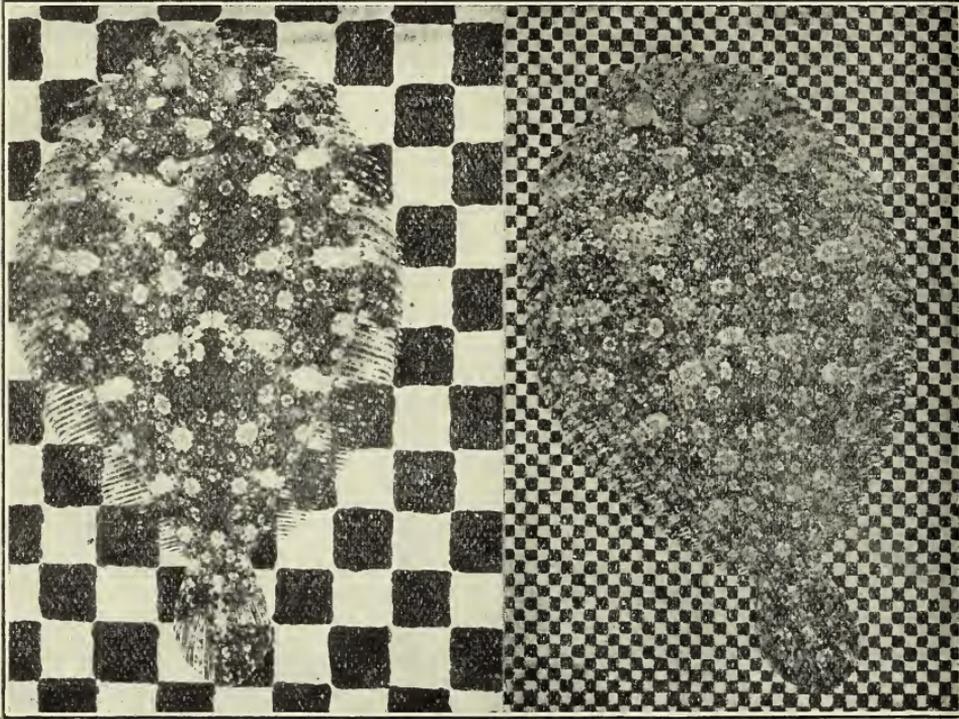
### THE STONE AGE.

Under the heading 'The Stone Age,' a little while ago, a Yorkshire paper referred to some forthcoming discoveries at Scarborough, for which favourable weather was wanted. Before excavations were made the reporter wrote: 'So far, only one grave and stone coffin have been revealed. The coffin has been left in its place and the entrance to the grave resealed, in the hope that better weather will prevail and allow of the work, which is now of a very interesting stage, being continued. The excavators and those in possession of valuable data regarding the archæological history of the North and East Ridings believe that they are on the eve of making further important discoveries which, when brought to light, will place Scarborough in the front rank of places with a history and past of which any town might reasonably be proud.' Unfortunately, the 'coffin' did not turn out to be a coffin, and there seemed to be no evidence of human burial at all, so that we heard nothing more in the press about the wonderful discoveries, and Scarborough stands where it did!

### COLOUR CHANGES IN FLATFISHES.

Among the many pieces of good work done at the British Museum (Natural History), London, is the publication of postcards to popularise the collections in that Institution. A set of these has been issued, together with a leaflet describing them, illustrating the variation of the markings of flatfishes. Two of these we are permitted to reproduce. The description given is as follows:—'The Flatfishes, a group that includes many well-known and important food fishes, such as the Plaice, Sole and Turbot, differ from all other fishes in that they have both eyes on one side of the head, the right side

in some species (*e.g.*, Plaice, Flounder, Dab, Sole), the left in others (*e.g.*, Turbot, Brill). They live at the bottom, with the eyed side uppermost and the blind side underneath; the eyed side is coloured and the blind side is generally white. When first hatched, Flatfishes have an eye on each side of the head and swim upright; but at an early age one eye moves round the top of the head on to the other side, and



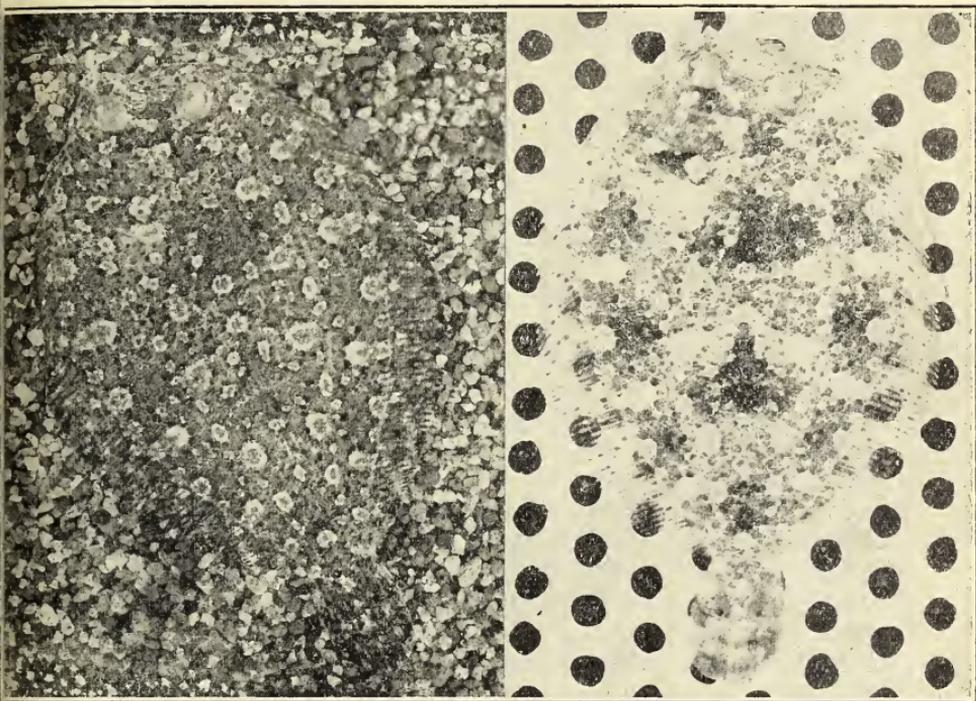
Colour changes in Flatfishes.

*Platophrys podas.*

The same individual on two different grounds.

the little fish sinks to the bottom and henceforth lives with the eyed side uppermost. This series of photographs is intended to illustrate the remarkable power that Flatfishes have of rapidly changing their colour in order to resemble the ground on which they lie. They were taken by Professor F. B. Sumner, of the University of California, to whom the Museum is indebted for permission to reproduce them; they represent a Mediterranean fish (*Platophrys podas*), more nearly related to the Turbot and Brill than to any other British species. When two photographs appear on one card they are of the same individual on different grounds. According to Professor Sumner the ability of this fish to adapt itself

to different backgrounds is limited to the black, white, gray, and brown of its customary habitat. Also it has certain definite spots and markings, which vary in their relative intensity, and may disappear, but when present, always have the same form and position. Professor Sumner found that, when placed on patterns of squares, crosses or circles, the fish responded more slowly than it did when placed on sand,



**Colour changes in Flatfishes.**

*Platophrys podas.*

The same individual on two different grounds.

gravel, or mud, but with practice, acquired the power of changing more rapidly than at first. Flatfishes of the genus *Paralichthys*, studied at Beaufort, N. Carolina, proved to have a much wider range of change than that of *Platophrys podas*; on blue, green, yellow, orange, pink, or brown of various hues they assumed a colour remarkably similar to that of the background. These changes in pattern and colour result from the concentration or distribution of pigment granules in cells in the skin known as chromatophores. The movements of the pigment granules result from stimuli received through the eyes; that is to say, the fish changes its colour to resemble the ground that it sees.'

## ARCHÆOLOGICAL COLLECTION AT GRASSINGTON.

The following letter, signed by Prof. Poulton, was printed in *The Yorkshire Post* recently: 'Will you permit me, as one deeply interested in the historic and prehistoric archæology of Yorkshire, to plead for some adequate provision in Grassington for the fine collection brought together with loving care by Mr. J. Crowther? It is fortunate for science that there should be living at the centre of a district so rich in archæological material a man whose delight it is to preserve specimens as they are discovered, and, of equal importance, to expend the utmost care in observing and recording all the attendant circumstances, thus ensuring that nothing of scientific interest will be lost. It is not for me to suggest the means. I feel confident that one or more Yorkshiremen who love their county will see to it that this fine collection shall no longer suffer, as it does now, for want of space in which it can be displayed and studied and be made an inspiration to many, and that a permanent home will be provided for it in the capital of Upper Wharfedale, at the heart of the district from which it came, and to which it should always belong.'

## THE GRASSINGTON MUSEUM.

Without in any way wishing to minimise the good work Mr. Crowther is endeavouring to do in looking after any finds made in his district, before an appeal is made towards preserving his collection would it not be well for some expert to give us an idea of the nature of the collection, and of its value, scientific or intrinsic? This seems necessary as unsuccessful attempts apparently have been made to dispose of it in recent years. If the collection merely consists of two or three skulls and other bones of uncertain age, and a not very large series of flint implements, etc., it may be suggested that the best resting place for the specimens would be in the nearest public museum. In common with other Yorkshire archæologists we are prepared at any time to assist an appeal for funds for the retention in the county of anything worthy of preservation, but surely we should know towards what we are subscribing, and what methods will be adopted for the proper exhibition of the collection should anything happen to Mr. Crowther? \*

## FRESHWATER LARVAL TREMATODES.

Mr. F. J. Brown, M.Sc., contributes a monograph on 'Some British Freshwater Larval Trematodes, with Contributions to their Life Histories,' to *Parasitology* for January. Since the interesting observations made in the early 'eighties in reference

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\* A note on these lines was sent to *The Yorkshire Post*, but was not published.

to the association of *Limnæa peregra* and the liver fluke, by means of cercariæ, much interest has been taken in the larval trematodes of this country. Mr. Brown had made some investigations at Birmingham, and as soon as he removed to Leeds these have been continued in Yorkshire, particularly with regard to the parasites of *Limnæa stagnalis* and *Limnæa peregra*. The author points out that—'It is very difficult to estimate the effect of these parasites on their host; that they are harmful is indisputable. The digestive gland usually looks unhealthy, particularly in infections of Echinostome and stilet cercariæ. The gonad, however, is rarely infected. Observations in aquaria are of little use, since the conditions are far from natural, but it is noticeable that molluscs infected with Echinostome or stilet cercariæ die sooner than those infected with fork-tailed cercariæ. Lebour states that the presence of rediæ certainly injures the molluscan host, but the presence of cysts, even in great numbers, seems to do little or no harm.

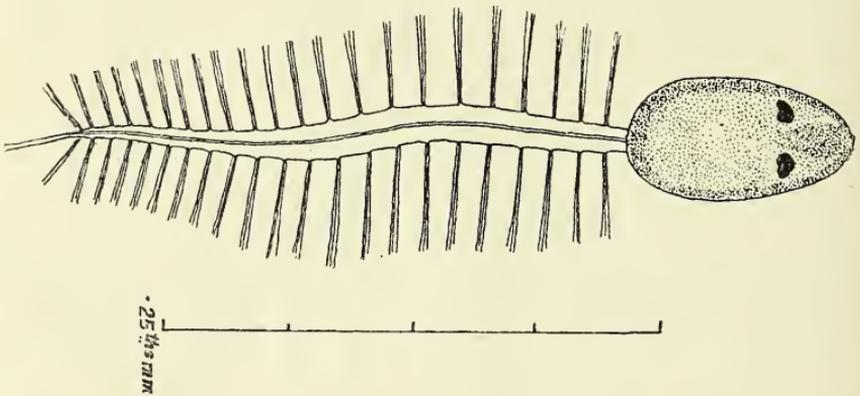
#### PARASITES OF LIMNÆA.

'The same is true of freshwater larval trematodes. In some cases, double infection may occur in the same individual. Sewell states that in India double infection is rare, but Faust in America found several instances of it. According to Faust, Ssintzin, who examined several thousand snails, made no record of double infection. So far I have not found any examples of double infection in the Leeds district, but the following have been found in the neighbourhood of Birmingham: three examples of *Cercaria pseudarmata* n.sp. and *Cercaria fissicauda* (La Val) in *Limnæa stagnalis*; one example of *Cercaria pseudarmata* n.sp. and *Cercaria equispinosa* n.sp. in *Limnæa stagnalis*; two examples of *Cercaria echinata* von Sieb. and *Cercaria equispinosa* n.sp. in *Limnæa stagnalis*. No instances of double infection have been found in *Limnæa peregra*. The cysts are often found associated in the same individual, particularly in the case of Echinostome cercariæ. Although there is reason to believe that the intermediate host is not always specific, I have not found any examples of non-specificity up to the present. Cort also states that fork-tailed cercariæ readily adapt themselves to new molluscan hosts.'

#### TRANSACTIONS OF THE LIVERPOOL BIOLOGICAL SOCIETY.

Volume XXXIX. of the *Proceedings and Transactions of the Liverpool Biological Society* naturally has much to say in reference to the wonderful work accomplished for the Society by the late Professor W. A. Herdman. Mr. W. S. Laverock, the President, has an address on 'Biology and the Man in the Street.' There is an excellently illustrated memoir on *Botryllus*, by E. Catherine Herdman; the usual report on the work of the Marine Biological Station at Port Erin and of the

Lancashire Sea Fisheries Laboratory and the Sea Fish Hatchery at Piel, near Barrow. These include many valuable and interesting natural history items. Among the illustrations there is one which we are permitted to reproduce, of which the following description is given :—‘ The organism represented in the figure was found in a tow-netting taken on November 10th. Its general form suggests that of a tadpole larva of some Tunicate. Running down the median line of the tail there is a structure not unlike a notochord ; but the large paired eye-spots and the paired lateral appendages appear to me to exclude the organism from the phylum Tunicata. The head is depressed, but almost as convex ventrally as dorsally. At its anterior end and between the conspicuous eye-spots there is a dark body, clearly distinguishable from



the surrounding tissue, from which what may be an oesophagus passes in the direction of the tail, but soon becomes lost to view. Posterior to this there is a transversely oval clearer area suggestive of a sucker. Excepting the eye-spots the organism is colourless. So far as could be ascertained by observation of the living organism, movement was effected by rapid vibration and contortion of the tail, the appendages being held rigid and at right-angles to the tail. The appendages do not appear to be chitinous. They are strap-like, rounded at their ends, and lose their rigidity on preservation in weak formalin. An organism closely similar to this occurred in a tow-netting taken on February 15th, 1922. In that, however, the eye-spots were longitudinal and the tail, especially the posterior half presented clear evidence of segmentation. The segments of the middle third of the tail only carried appendages like those described above.’

#### CONCEALED COALFIELDS OF YORKSHIRE AND NOTTS.

We should like to congratulate the Geological Survey on its improved methods, not only of carrying out the work of

this important Government Department, but in the speed with which the results are given to the public. It only seems quite recently that the Director organised a series of branch offices, one of which found a home in Yorkshire. We referred some little time ago to the excellence of a memoir dealing with 'The Concealed Coalfield of Yorkshire and Nottinghamshire.' The edition of this became exhausted in 1923, and under Dr. G. V. Wilson, who has made extraordinarily complete and detailed investigations of the various sections in this area, another edition has been published. Since 1913, borings and other sources of information have considerably extended our knowledge of the underground coal measures, and what were thought to be no more than mere speculations by certain amateur geologists as to the probable eastward extension of the coalfields, and received with a certain amount of scepticism in certain quarters at the time, have since proved to be well founded, and, in fact, recent borings have demonstrated the probability of the more extravagant of the suggestions being accurate. The present memoir necessarily contains much that was not published in the previous edition, made possible not only by the officers of the Survey, but by a whole army of amateur workers in the district, who have placed their information at the services of the State. From a practical point of view, not the least valuable part of the memoir is the wonderful series of sections, giving details of borings; the remarkable map as frontispiece which indicates at once the wealth of information available, and, published separately, two excellently coloured sections of borings and shafts in the district, the main seams being correlated. These are on sale at 2/6 each. The volume it well-bound in cloth, contains 283+xiv. pages, and at 8/- is remarkably cheap.

#### BIRD PROTECTION.\*

The sub-title of this work is 'An Account of the State of our Bird-life and a Criticism of Bird Protection.' The author informs us that 'the history of bird protection has been treated at some length, for the difficulties of the present day, though very different from the problems of even twenty years ago, must be solved in the light of it. If present-day bird protectionists knew, first of all, more about birds, and, secondly, more about bird protection, they would believe fewer fallacies and accomplish far more that is necessary and worth accomplishing. That applies to some extent to every one who has written on the subject, myself not excepted. But I hope that the consultation of an enormous number of

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\* 'Birds in England,' by E. M. Nicholson. London: Chapman & Hall. xix. + 324 pp., 12/6 net.

authorities, and the comparison of so many shades of opinion as the writing of this book has demanded, has enabled me to gain by this time a view of the subject which is, in broad outlines, the right one.' This explains the theme of the book, which is illustrated by eight of the now somewhat well-known wood engravings by E. Fitch Daghish, some of which are almost startling.

#### CORRELATION OF PERMO-TRIASSIC ROCKS.

Dr. R. L. Sherlock, who has specialised in the study of the subject, has a lengthy memoir on 'A Correlation of the British Permo-Triassic Rocks, Part I., North England, Scotland and Ireland,' in the *Proceedings of the Geologists' Association*, issued on March 21st. In this he concludes:— 'Evidence has now been brought forward to show that the divisions of the British Permo-Trias are lithological and not chronological divisions, although there is a general succession of strata of Zechstein, Bunter, and Keuper facies. For convenience these names may no doubt be used, just as we speak of the First, Second, etc., Millstone Grits, although we now know that these names are of merely local significance. A more scientific classification of the Permo-Trias is desirable, and certain datum-planes are suggested as offering definite time-horizons, which may enable different areas to be correlated with one another. Thus, the Upper Magnesian Limestone of Durham Co. and Yorkshire proves to be represented by Bunter in South Nottinghamshire, and we may eventually find a representative in part of the enormously thick Keuper of Cheshire. . . . In the present paper a geographical treatment has been attempted as most convenient; but, as, owing to subsidence, the topography that existed during the earlier part of the Permo-Triassic times became greatly modified later on, it seems desirable to leave over for Part II. the correlation of the upper part of the system. The higher strata are, in fact, much more uniform over the country than the lower members, and it is more convenient to discuss the salt-deposits of Ireland, Lancashire, the Isle of Man, and the Midlands, together, although some of these places are geographically within the limits of the area now described. Here then it need only be mentioned that all the British salt-beds, except those of Yorkshire and Durham, belong to the same two horizons; that the gypsum horizons *D* and *C* are found only in Yorkshire, and there only locally; that gypsum horizon *B* is confined to an area around Leicestershire; while gypsum horizon *A* extends from North Yorkshire to Somerset with gaps; and the datum plane marked by the base of the Rhætic Beds is all but universal, the Carlisle area being the doubtful exception.'

## NOTES ON YORKSHIRE AMMONITES.

DR. L. F. SPATH.

## VIII.—MORE LOWER LIASSIC FORMS.

*(Continued from page 140).*

So soon as ornamentation or change of whorl-shape appear, slow and gradual evolution in the two persistent root-families gives place to comparatively rapid differentiation, but it is doubtful whether this mutability [not 'explosive' development] was due to local conditions, or whether it affected corresponding stocks contemporaneously in different centres of development. In a very interesting paper, A. Born<sup>1</sup> has, however, recently shown how the passive distribution of a fauna by means of ocean currents may cover enormous areas in the course of a few years; and the assumption of absolute synchronism of ammonite deposits, now generally favoured, seems indeed justified. It is interesting to note in this connection that the comparative independence of facies of the trachyostracous ammonites was also again demonstrated recently by the discovery of Upper Jurassic Virgatitids of supposed 'boreal' affinities in Somaliland,<sup>2</sup> and of Albian Pseudoceratites (*Engonoceras*) of Mediterranean 'facies' in the Gault Clay of Folkestone<sup>3</sup> and the 'Upper Greensand' (*dispar* zone) of South Dorset.<sup>4</sup>

Short of assuming that there was such inter-breeding in ammonites as to render hopeless any attempt at classification, it seems that only the hypothesis here held will explain the numerous puzzling cases of convergence to which we have referred, and the occasional surprising similarity, even in suture-line, in members of stocks supposed to be widely separated. The more we examine the views hitherto held, the more precarious seem their foundations, and we understand why there is no satisfactory sub-division of the Order Ammonoidea. Our modest knowledge is, of course, still insufficient to justify a final classification; but, meanwhile, it must not be forgotten that the far bigger groups of Nautiloids and Goniatites, of Permian, Triassic and Cretaceous ammonites afford many a striking parallel to the cases of convergence known in our own local Lower Lias.

<sup>1</sup> 'Die Bedeutung der Meeresströmungen für die geologische Zeitrechnung.' 50. *Ber. Senckenb. Naturf. Ges.*, 1920, Hft. IV., pp. 207-217.

<sup>2</sup> Spath, in 'Monogr. Hunter. Mus., Glasgow,' Pt. VII., Ammonites and Aptychi, 1925, pp. 111-164.

<sup>3</sup> Spath, 'Annals Mag. Nat. Hist.', Ser. 9, Vol. XIV., 1924, pp. 504-8.

<sup>4</sup> Found by Mr. T. F. Grimsdale, and kindly communicated to the writer for description.

To sum up with regard to *Gagaticeras* and its allies, for those bewildered by our Shandean digressions, it seems justifiable to include Echioceratids in the super-family Arietida which, with *Epophioceras*, and certain evolute Mediterranean genera, probably persisted through the period of dominance in North-western Europe, of *Eparietites*, *Astero-ceras* and their involute derivatives. We may also consider *Parechioceras* to be a lateral offshoot of one of the Lytoceratid stocks that replenished the Arietids, corresponding to the earlier *Ægasteroceras*, whilst *Gagaticeras* may be merely a capricorn development of that stock, converging towards the Xipheroceratid *Bifericeras*, as *Echioceras* itself is more or less homœomorphous with the simplified Deroceratid offshoot *Microceras*. *Promicroceras*, a simplified Xipheroceratid branch, would neither again complicate its suture-line nor develop into such a totally distinct stock as Echioceratids.

As in Deroceratids, it is tempting to consider the genera so far known to be more representative than they really can be, and to connect them up directly, as was done by the early evolutionary enthusiasts out to prove the theory of descent. The Lytoceratid offshoots may be many or few; the connection may be more direct or more indirect than we think; but the super-family Arietida is retained as a useful systematic unit, though polyphyletic and including merely convergent adaptations.

It may be added that the Hull Museum collection also includes an isolated example of *Vermiceras* (group of *V. spiratissimum*, Quenstedt sp.) and two imperfectly preserved '*Coroniceras?*' the former specially recorded because *Vermiceras* have so frequently been mistaken for Echioceratids of a much higher horizon ('upper *conybeari*'). One of the '*Coroniceras?*' is the '*Paltopleuroceras* sp. nov.?' of Mr. Thompson's list (p. 181); and like the second example, listed as '*Coroniceras schlaenbachii?* (Reynès?)', it is probably more correctly referable to *Epammonites*. Neither example shows tuberculation, and the ribbing is that of the *latisulcatus-grecoi* group.

*Euagassiceras* is represented by a fine series of specimens of *Eu. striaries* (Quenstedt), in addition to the forms (*Eu. spinaries*, Quenstedt sp., *Eu. sauzeanum* d'Orbigny sp.) already listed by Mr. Thompson. These species are connected by transitions with the earlier *Agassiceras*, e.g., *A. decipiens* (Spath), and a number of new species could, no doubt, be founded on what may after all turn out to be merely individual variations within these gentes. It seems best, however, not to attempt sub-division until zonally collected material be available, nor to separate, for the present, several new forms transitional between the group of *Euagassiceras transfor-*

*matum* (Simpson) S. Buckman sp.<sup>1</sup> and *Defossiceras*, above discussed.

I had intended to leave the Lower Lias with the present note and to go on to the remaining ammonites of the Upper Lias and later formations; but a recent paper by Werner Lange<sup>2</sup> makes it necessary to devote another chapter to a review of the ammonites of the Hettangian and Sinemurian, including the Psiloceratan, Schlotheimian, Vermiceratan, Coroniceratan, Agassiceratan, Arietitan, Asterocheratan, Oxy-noticeratan, and Deroceratan ages.

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### FIELD NOTES.

**Great Bustard in Yorkshire.**—A Great Bustard was picked up dead on Islebeck Grange Farm, near Thirsk, on March 1st. It had haunted the neighbourhood since Christmas. The bird was taken to Mr. Robert Lee for preservation, and is stated to be a female. It is probable that it died of starvation, as it only weighed 6 lb. 14 oz. It is in good plumage, and there was no sign of any injury, except of old standing. The left leg appears to have been fractured at some time, but has knitted together again; it is, however, thicker than the other one. The liver was diseased, being much enlarged, very hard and covered with white spots.—R. FORTUNE.

**Hoary Redpole at Scarborough.**—On Friday, December 18th, 1925, a small finch was picked up in a disabled and dying condition in Alma Square, close to the railway station at Scarborough. The finder, Mr. C. H. Hargreaves, very kindly brought it to me, but it was then dead. Judging from the large size, wing measurement, and unspotted white rump, I thought it to be an example of the Hoary Redpole, but lacking material for comparison to ensure correct identification, I sent the skin to Mr. R. Fortune, and afterwards to Mr. H. F. Witherby, who showed it to Dr. Hartert, and these authorities confirm my identification. The bird, on dissection, proved to be a male, probably adult, and had died from a fracture of the base of the skull. It is a native of the sub-polar regions of Europe and America, this being, I believe, the seventh record of its occurrence in Great Britain.—W. J. CLARKE.

The Hoary Redpole has been previously obtained in Yorkshire on three occasions. One, Easington, during the winter of 1893-4, and two at Skeffling on December 30th, 1898. The other three specimens recorded were obtained on Fair Isle.—R. F.

<sup>1</sup> 'Yorkshire Type Ammonites,' Vol. II., 1913, Pl. LXXXV.

<sup>2</sup> 'Zur Paläogeographie und Ammonitenfauna des Lias *a*, nebst einer Revision der Nürtinger Psilonotenfauna.' *Zeitschr. Deutsch. Geol. Ges.*, Vol. LXXVII. (1925), Abh. No. 4, pp. 439-528, Pls. XVIII.-XXI.

**Blue-throated Warbler at Scarborough.**—My note (*The Naturalist*, March, 1926, page 86) about the occurrence of a Blue-throated Warbler in my garden at Scarborough recounted its movements between November 15th, 1925, the date of its first appearance, and January 14th, 1926. Between the latter date and April 4th it scarcely missed a day, and frequently paid its visits several times daily. After April 4th it became a little more irregular in its visits, but appeared on the 8th, 11th, and 15th, since when we have seen it no more, and doubtless it has departed to its native land. During this time it became very tame, and would



**Blue-throated Warbler.**

come fearlessly into the kitchen and eat crumbs off the oilcloth within four or five feet of the occupants of the room. Although so bold with human beings, even strangers whom it had not seen before, it was very nervous among other birds. It always gave way to a Sparrow, and the sight of a Starling sent it in terror out of the garden. It frequently foraged on the lawn, and appeared to stand and listen for its prey, suddenly making a little run forwards or sideways, and, plunging its beak into the ground, would draw out a leather-jacket or earthworm. The latter were not swallowed unless very small, even a moderate sized one was thrown on one side and not eaten. About the middle of March the bird began to moult, the operation being not completed when it left, but the blue of the band on the chest had become considerably brighter, although it covered no greater area.—  
W. J. CLARKE.

## THE DESCRIPTION OF NEMATOCEROUS FLIES, ESPECIALLY CHIRONOMIDÆ.

GEORGE GRACE, B.SC.

(Continued from page 136).

### THORAX (Fig. 2).

The thorax consists essentially of three chitinous rings known as the PROTHORAX, MESOTHORAX and METATHORAX. The prothorax is not well developed in flies, and consists of a slender chitinous ring nearly hidden under the front edge

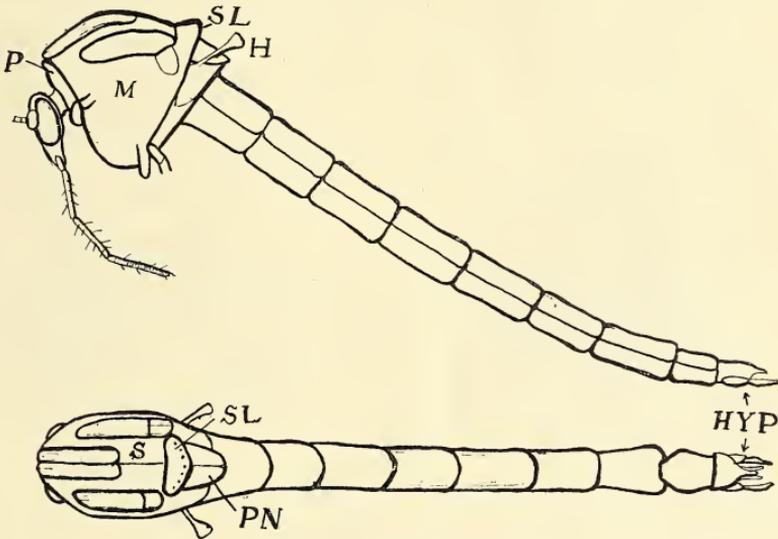


FIG. 2.—*Chironomus*.

P.—Prothorax. S.—Scutum. M.—Mesothorax. SL.—Scutellum.  
H.—Halteres. HYP.—Hypopygium. PN.—Postnotum.

of the mesothorax. It carries the fore legs. The dorsal part of this ring is the PRONOTUM, and sometimes projects slightly in front. Its colour and the shape of its anterior margin are sometimes of use in descriptive work.

The mesothorax forms the greater part of the thorax, and carries the mid pair of legs and the wings. Its dorsal part, the MESONOTUM or DORSUM, is divided by two sutures into (1) the SCUTUM (mesoscutum), (2) SCUTELLUM (meso-scutellum), and (3) POST-NOTUM (post-scutellum). In the Tipulidæ the scutum is again divided by a transverse DORSAL SUTURE into PRAE-SUTURAL and POST-SUTURAL regions, when the names PRE-SCUTUM and SCUTUM are used to denote the two divisions. This suture is absent in most families,

and then the term scutum is used for the whole area as above. The scutum often carries four prominent longitudinal STRIPES or VITÆ, which are generally darker than the ground colour. The two middle stripes sometimes appear to join into one central stripe, but are oftener distinct with a suture between. Early writers speak of three stripes, but it seems better to regard the number as always four. The shoulders in front of the lateral stripes contain the MESONOTAL PITS or HUMERAL PITS, the size and colour of which are occasionally useful in descriptions. Pubescence in the form of definite small hairs is often present between the stripes, or its place is taken by a dull bloom like that on ripe fruit, which is described by various writers as pruinescence, pruinosity, frosty-tormentum, pollenosity, or simplest of all as dust.

The post-notum behind the scutellum was, until recently, regarded as part of the metathorax and named the metanotum, but it is now always regarded as belonging to the mesothorax.

The ground colour of the different parts of the mesonotum, and the presence or absence of pubescence or pruinosity, and whether the general effect is shining or matt, are all of great importance.

The sides of the mesothorax are the MESOPLEURÆ, and carry the thoracic spiracles. The ventral part consists of a convex prominence, the MESOSTERNUM. The mesopleuræ have been sub-divided into a number of parts which are used in the classification of the Mycetophilidæ. Full particulars are given in Mr. Edward's paper on that family in the *Trans. Ent. Soc.*, 1924, Pts. III. and IV.

The metathorax is very narrow and inconspicuous. It carries the hind legs and the HALTERES, which represent the second pair of wings. The colour of the halteres, especially the knobs, should always be noted.

#### ABDOMEN (Fig. 2).

The abdomen of a male fly is generally more cylindrical and less bulky than that of a female. As in many insects it appears to consist of nine segments, each made up of a dorsal TERGITE and a ventral STERNITE, connected laterally by a more flexible membrane which carries spiracles. In the male the ninth segment is very much modified, and carries the reproductive armature or HYPOPYGIUM. In the female both the eighth and ninth segments are modified for sexual purposes. The colour of the tergites and the patterns on their surfaces are of use in systematic work, but the most important part of the abdomen for systematic purposes is the hypopygium. This seems to assume some special form in almost every species, so that it is often the most definite feature on which to depend, *e.g.*, the four great groups into

which the Chironomids are divided, viz., (1) Orthocladariæ, (2) Diamesariæ, (3) Tanypinæ, (4) Chironomariæ. have four quite distinct types of hypopygium.

### THE ORTHOCLADIARIAN HYPOPYGIUM (Fig. 3).

Viewed from above the DORSAL PLATE of the ninth segment terminates in the DORSAL POINT or ANAL POINT, which is sometimes long, sometimes short, and occasionally missing. From beneath this projects a pair of FORCEPS or PINCERS, each arm of which consists of a BASAL SEGMENT or BASISTYLE, and a TERMINAL SEGMENT, DISISTYLE or CLASPER. The latter of these is turned so as to point in an antero-dorsal direction, and generally carries at its tip one or two teeth and several stiff hairs. The internal border of the basal

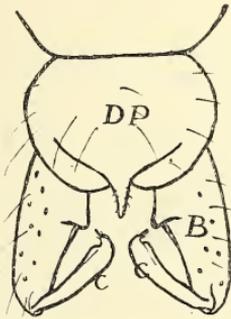


FIG. 3.—Orthocladarian Hypopygium.

DP.—Dorsal Plate. A.—Appendage.

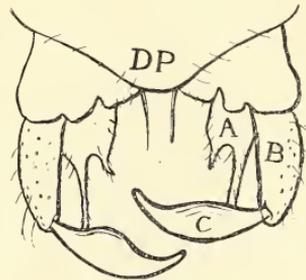


FIG. 4.—Diamesarian Hypopygium.

A.—Appendage. B.—Basistyle. C.—Clasper.

segment is often enlarged into one or more lobes of shapes which are different in almost every species, and hence of great importance.

### THE DIAMESARIAN HYPOPYGIUM (Fig. 4).

This is rather similar to the above, but the claspers are more varied in shape and the basal segments sometimes carry curious appendages. One of the commonest species is figured, but it is impossible by means of only one figure to indicate the great variety of shape found in this group.

### THE TANYPINE HYPOPYGIUM (Fig. 5).

This is easily recognised by the more massive basal segments, and more spine-like claspers.

### THE CHIRONOMARIAN HYPOPYGIUM (Fig. 6).

This seems by far the most specialised form, and needs more careful description. The terminal segment is not

turned upwards, and is never so claw-like as in the other groups, and between the basal segments a number of appendages are almost always found. In *Chironomus* and its allied genera these are normally two pairs, viz. (1) the upper or DORSAL APPENDAGE, and (2) the lower or VENTRAL APPENDAGE. This latter is often covered with curious curved hairs.

In *Tanytarsus*, as a rule, there are three pairs, (1) DORSAL, (2) MIDDLE, (3) VENTRAL, of which the middle pair appears to be homologous with the ventral of *Chironomus*. In some species of *Tanytarsus*, too, the dorsal appendage carries a finger-like projection, which is regarded as a fourth or SUPPLEMENTARY APPENDAGE.

The female armature has not been studied so fully as the male, and it is doubtful whether it can ever be used to

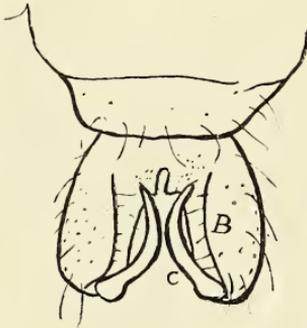


FIG. 5.—Tanypine Hypopygium.

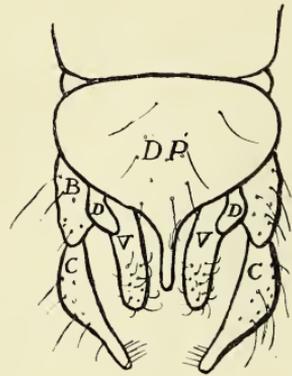


FIG. 6.—Chironomarian Hypopygium.

DP.—Dorsal Plate. B.—Basistyle. C.—Clasper. D.—Dorsal Appendage. V.—Ventral Appendage.

the same extent in systematic work. The determination of the species of females is, therefore, often very difficult.

## THE LEGS.

Each leg of a fly is made up of COXA, TROCHANTER, FEMUR, TIBIA and TARSUS, as in most insects. The tarsus consists of five segments, of which that nearest the tibia is the first or METATARSUS. The fourth is generally cylindrical and longer than the fifth, but in certain genera it is more or less heart-shaped and shorter than the fifth. This should always be noted. The other segments are always cylindrical. The colours of all the segments of the leg and any ornamentation they bear should be noted.

(To be continued).

## THE WATER VOLE IN RELATION TO PRE-HISTORIC MAN.

FREDK. J. STUBBS.

(Continued from page 144).

It will be seen that I am not convinced that these Water Voles entered the barrows of their own will. Much of the evidence goes to show that they were placed there during the making of the mound; and on the other hand I cannot find that the theory of hibernation or necrophagy fits in at all with my own knowledge of the habits of Voles. Archæologists have recognised for many years that the numerous flints, large bones, weapons, and fragments of broken pots were scattered in the earth during the burial ceremony. Folklorists have traced a connexion between this ancient custom and our modern practice of scattering flowers or soil on a coffin before the grave is filled in. A well-known passage in Shakespeare, where mention is made of scattering 'shards, flints, and pebbles' on Ophelia's coffin—a suicide, and therefore to be buried with pagan rites—has been used with great plausibility to link the customs of Shakespeare's days with the pagan rites of the barrow builders.\*

And I suggest that in the presence of the bones of Water Voles in ancient barrows, we have evidence of one of the oldest of religious cults—that of mouse worship. This subject has not, so far as I can learn, been made the subject of prehistorical study; and I am to thank the wider folklore knowledge of my wife in drawing my attention to many scattered notes, and particularly to a chapter in Andrew Lang's 'Custom and Myth.' I can but state that the worship of the mouse (or the rat, for the words are synonymous in ordinary speech) has been definitely traced in Ancient Egypt, Ancient Greece, Peru, Samoa, Palestine, France, and Saxony. Apollo, as is well-known, was distinctly the 'Mouse God'—*Apollo Smintheus* was one of his titles. Sacred mice were kept beneath his altar in Ancient Greece, and a golden image of a mouse was placed on the adjoining tripod. I have already written† on the recognition by the ancients of the connexion between bubonic plague and rats—as science, a discovery of the present century; and we are told in the Bible (Samuel i. 5) how the Philistines worshipped golden images of the mice and the 'emerods' [the bubonic swellings] during a plague.

Scattered references to this 'mouse religion' occur in

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\* *Hamlet*, Act V., Scene 1.

† 'A Critical Study of British Rats,' *Wild Life*, 1914.

many archæological works. It is rather surprising that no connexion has been suspected with the Vole-remains recorded under such curious conditions in prehistoric barrows; and it is also a matter of surprise that naturalists have not dealt with the archæological findings. Mr. Donald Mackenzie's 'Ancient Man in Britain' contains a good summary of our knowledge of early folklore, but he does not mention the Water Vole.

To come now to the smashed skulls. If we assume that the Voles were actually thrown into the mound during building, how were the animals procured? In my youthful days, when energy was cheap and wet feet and legs had no terrors, I have caught Water Voles by hand. Afterwards, when collecting mammals, I used traps, with no great success. A shot gun is the best weapon for these alert if sluggish animals. But we may be sure that prehistoric man, not primarily an agriculturist, had to depend largely on the chase, and was doubtless as able a trapper as are modern savages.

It would be easy to devise a trap made of pliant twigs, such as those of hazel or willow, which would smash down on a particular point an inch or so behind the bait when the trigger was touched. If Voles are to be procured in great quantity, traps or poison are the only methods likely to be practicable; I well remember my efforts long ago with bow or catapult or hand-thrown stone, both on Voles and rats. The 'dead-fall' trap so popular amongst gamekeepers can only be used where the local geology provides an adequate supply of flat stones. In the small Buxton consignment I can detect none of the terrible injuries to the bones that would be made by a dead-fall. The only damage is that of the hinder part of the skull; and, therefore, if the animals were caught, I suspect the use of some sort of trap operating on the principle of the modern metal 'break-back' used for mice or rats. I have used, in my unregenerate days, a twig trap for catching birds by snatching them into mid-air at the end of a horsehair noose. The same principle, operating in the opposite direction—perhaps like a primitive mole trap—seems quite feasible for Voles. At any rate, this suggestion seems to fit more of the facts than the only other alternative, that the skulls have been destroyed by the rotting action of long burial.

One cannot be altogether safe in accepting the views of archæologists on what is largely a matter of natural history; indeed, it is at least possible that archæologists have had a good case, but have stated it so badly that the naturalist cannot accept their views. What is needed is a careful study of the Voles' bones *in situ* in a barrow, before whatever evidence they hold has been vitiated by thoughtless handling;

and this work is best done by one who is conversant with the habits and the structure of mammals, and whose mind is not prejudiced by the current opinions on these 'rats' bones.'

In the consignment gathered so casually by Mr. Armitage I found, besides the remains of Water Vole, and fragments of what were perhaps human bones, the upper jaw and one or two teeth of the Field Vole (*Microtus agrestis*). After I had disposed of every splinter of bone, I found myself with eight legbones of the toad—a species which I do not find listed in the fauna of British barrows. Mr. Armitage has photographed these eight bones, and it will be seen that every one has had the ends broken away until they are all approximately the same length; the appearance of one or two of the ends suggests strongly that the shortening has been done by some sharp instrument.

The actual bone is the *os cruris* (the fused tibio-fibula or main 'leg-bone'); we have here the remains of at least four individual toads, and the fact that I failed to find other traces of this animal is interesting, even although it is not conclusive. To my mind, these bones are the remains of a bone necklace or other ornament. The *os cruris* of the toad (like that of the frog) is perforated completely by a small round foramen, and by experiment I find that it is possible to thread a horsehair or similar bristle through this natural perforation. The question at once arises, were necklaces of toad's legbones threaded on hair regular ornaments of the men of the round barrows? To use the explanation of coincidence for the presence of eight truncated bones, each one fit to be used as a bead (analogous to the beads of many modern savage races), in a single one-pound consignment of earth seems rather too far-fetched.

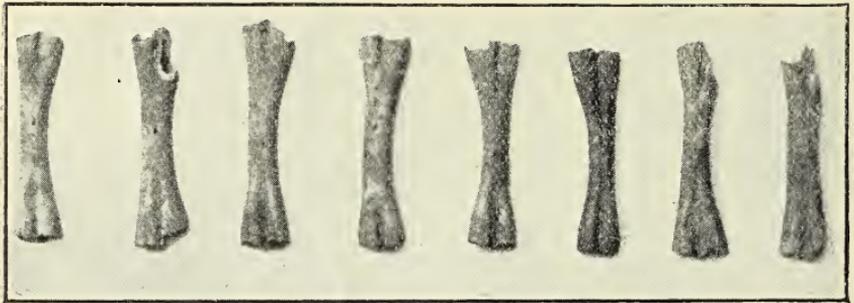
The total absence of ribs and vertebræ in the consignment, the comparative rarity of pelves and shoulder blades, and the presence of small phalangeal bones are details on which one would like more information. If the box was a 'fair sample' (which is doubtful), one might be justified in wondering if the animals were flayed before burial, and their tails removed before they were placed in the barrow. I am perfectly well aware that some students will bristle instantly at such wild guesses as these. Yet consider how valuable has been Bateman's 'guess' that these Voles were rats! And, moreover, there is always the difficulty of securing an adequate supply of Voles for an unexpected interment.

Obviously we have here nothing but the crudest possible form of classification. Dr. Thurnam admits the contemporary claim of deer or wild boar or goose because these animals do not burrow, and he refuses the claim of every species known to burrow. I cannot find any evidence that either

rats or mice (domestic) have been discovered in any barrow, and do not hesitate here to dismiss Dr. Thurnam's opinion as valueless.

Dr. Thurnam's subsequent work on 'Round Barrows' (*Archæologia*, Vol. XLIII.) mentions no small mammals of any sort; in fact, this irritating silence is pretty constant in most of the literature I have consulted. At present the position is unsatisfactory; either the archæologists are all wrong in looking upon Water Voles as mere casual invaders of the barrows, or naturalists are all wrong in believing that the animal is never carnivorous and never hibernates and is never gregarious.

An official to deal with the capture of rats or mice was attached to some English courts, and perhaps the office lasted to fairly recent times, and may then have been a survival from pre-historic days. In my former paper on 'Rats' I



Legbones of Toad from a Barrow near Buxton.

gave a reproduction of the actual document appointing Elizabeth Wickley 'His Majesty's Ratcatcher' in the Tower of London, His Majesty being Charles II.; previous Royal ratcatchers had appropriate uniforms. In the 20th century official ratcatchers cut off the tails of captured rats according to a useful and ancient practice.

However, these speculations can wait until one sees the result of study on the great deposits of Voles' bones in ancient barrows. A map showing the geographical range of Vole barrows would also be useful. Is there any authentic record from a 'Long Barrow?' I cannot find one. The standard work on 'Long Barrows' is perhaps Dr. Thurnam's paper in *Archæologia*, Vol. XLII., and at page 228 he disposes of possible Water Voles in the following words:

'The remains of rats, mice, rabbits, foxes, polecats, and badgers, all of which are occasionally met with, may be disregarded as those of animals whose burrowing propensities lead them to infest these tumuli.'

**Microgaster nobilis Reinh., British?**—In *The Entomologist's Monthly Magazine* for May, Mr. G. T. Lyle records *Microgaster nobilis* Reinh., a Braconid new to Britain, sent to him by Mr. W. J. Fordham, who obtained it among insects formerly the property of William Hewett, of York. The evidence of this being a British insect is not given, and in view of the wholesale way in which the late W. Hewett collected and exchanged, we should very much hesitate before accepting it as British. The Hull Museum was early in the field, and purchased hundreds of specimens from his collection, said to have been found in the neighbourhood, but many obviously were not.—T. SHEPPARD.

**Parthenogenesis in *Odontopera bidentata*.**—A female *Odontopera bidentata* emerged from a pupa which had been kept over winter in a little box. The moth laid quite a number of eggs, and eventually died without ever having left the box or any other insect entering it. Under these circumstances I placed no value on the eggs, yet on April 28th they hatched, and a lively little colony of young larvæ is now feeding on privet.—CHARLES MOSLEY, The Museum, Huddersfield.

So far as I know this is the first record of parthenogenesis in *Odontopera bidentata*. Its occurrence in the macro-lepidoptera seems to be very rare, and I only know of records of it in seven species. In the large genus *Psyche* (Tineæ) it is a normal habit. As lepidopterists usually throw away eggs laid by virgin females, it may possibly be commoner than is generally supposed.—G.T.P.

**Yorkshire Sawflies.**—Some months ago the Rev. F. D. Morice kindly named for me half a dozen species of Sawflies, which I found in my boxes, and which I had captured at different times in various Yorkshire localities. They are as follows:—*Tenthredella mesomella*, Bishop's Wood, near Selby; *Dolerus nitens*, Royd Edge Moors, Huddersfield, common in April; *Rhogogaster viridis*, Saxton, Tadcaster (Rev. C. D. Ash); *Rhadinocerea micans*, Askham Bogs, York, common; *Tenthredopsis inornata*, Bishop's Wood, Selby; *Pamphilius sylvatica*, Pennyspring Wood, Huddersfield. Of these, only the first mentioned seems to be recorded in the county list in the Victoria History, but Mr. R. Butterfield informs me that since the publication of that list, some of them have become well known as occurring in other districts in Yorkshire.—GEO. T. PORRITT, Elm Lea, Dalton, Huddersfield, May 15th, 1926.

**Hemiptera at Brayton, Cumberland.**—On August 7th last I did a little collecting on a piece of waste land near Brayton, a locality, I believe, hitherto unworked. I got *Anthocoris nemorum*, *Trigonotylus ruficornis*, *Mecomma ambulans*, *Orthotylus marginalis*, *Plagiognathus arbustorum*, and

*P. chrysanthemii*. *Philænus spumarius* was very common along a damp grassy hedge. In addition to the type form the following varieties occurred: *gibba*, *leucophthalmus*, *leucocephalus*, *lateralis*, *lineatus*, *biguttatus*, and *marginellus*. Other species taken were *Philænus lineatus*, *Euacanthus interruptus*, *Acocephalus nervosus*, *Deltocephalus repletus* (*D. distinguendus?*), *Thamnotettix prasinus* and *Cixius nervosus*.—JAS. MURRAY, Greta.

**Xerophila intersecta Poiret in Odense, Funen, Denmark.**—In *The Naturalist*, November, 1925, I recorded the occurrences of *Xerophila intersecta* Poiret in Denmark and Schleswig. Now Mr. cand. pharm. Kjerulf-Petersen, of Odense, sends me a number of specimens for examination found near Odense, and he informs me that the species occurs at three different places, one of which is covered with Lucerne (*Medicago sativa* L.). It seems probable, therefore, that it is introduced with Lucerne seeds, on the other hand possibly the occurrence is caused by transport by limestone from Faxe, or possibly as *X. intersecta* Poir. already is found at Lundeborg and Christiansminde, near Svendborg in S.E. Funen, the distribution in Funen now is more universal. In all probability the first introduction of *X. intersecta* Poir. in Denmark was by seeds of Lucerne (just like the appearance of *X. obvia* Hartm. at Rendsborg in Schleswig), and later the distribution in some cases is the result of transport by limestone from Faxe.—HANS SCHLESCH.

**Spotted Dogfish at Scarborough.**—I found a Spotted Dogfish here on April 30th, and succeeded in procuring both the head and the tail. I took these to Mr. W. J. Clarke, who announced them as belonging to a Larger Spotted Dogfish. The fish itself was quite four feet long.—J. A. STEVENSON Scarborough.

**The 'Drumming' of the Snipe.**—The cause of the drumming produced by the amorous male snipe in the breeding season has been a source of conjecture. The noise, which has variously been described as drumming, bleating and rasping was thought to have been produced by the vocal organs of the bird. By the aid of good glasses the cause no longer remained a mystery, as the drumming was clearly only produced during the headlong descent so characteristic to the bird, and that while this was occurring, the tail feathers were stuck out at right angles to line of descent. By procuring two of the longest and stiffest tail feathers of the Snipe and placing them in a small potato and placing the potato on the end of an arrow in such a way that the feathers are at right angles to the arrow, on shooting the arrow upwards it is found that *during descent* the drumming of the Snipe is produced with absolute fidelity.—S. G. SMITH.

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## REVIEWS AND BOOK NOTICES.

**Soil and Civilization**, by **Milton Whitney**. London: Chapman & Hall, x.+278 pp., 15/- net. While there is much of general interest in this well-illustrated volume, it principally relates to the United States, though an account is given of agriculture in the older countries of the world, this occupying the sixth chapter. The author describes the different forms of soils to be met with in different areas, refers to their origin, methods of cultivation, etc.

**Berwickshire and Roxburghshire**, by **W. S. Crockett**. London: Cambridge University Press, xi.+199 pp., 3/- net. This must be one



Roman Brass Cavalry Helmet from Newstead.

of the very few hitherto remaining unpublished of the interesting series of County Geographies being issued by the Cambridge Press, and the area covered by this is extraordinarily interesting and well described.

**What Evolution Is**, by **G. H. Parker**. London: Humphrey Milford, viii.+173 pp., 6/6 net. The Professor of Zoology at the Harvard University points out that the growing popular interest in evolution calls for a simple statement concerning this doctrine, which should be free from prejudice and partiality. In this work he has endeavoured to make such a statement, and we must admit that it is concise and devoid of technicalities. There are several suitable illustrations.

**The Mammoth and Mammoth-hunting in North-east Siberia**, by **Bassett Digby**. London: H. F. & G. Witherby, 224 pp., 12/6. The author gives results of his practical experiences in securing remains of the mammoth and other extinct animals in Siberia. He has taken

the opportunity of giving a general account of the geological history of the mammoth and his ancestors; representations of the animal on Palaeolithic carvings, etc.; illustrations of museum specimens, and so on. He then gives a racy account of his visit to the Ivory Isles, with photographs of the inhabitants, etc. Altogether he writes a very interesting story.

**A Synopsis of the Families and Genera of Nematoda**, by **H. A. Baylis** and **R. Daubney**. London: The British Museum, xxxvi.+277 pp., 10/6. Literature dealing with the Nematoda has hitherto been considerably scattered, and the increasing number of students has been greatly handicapped by the lack of a concrete treatise, with the necessary references, etc. This deficiency has been made good by the Trustees of the British Museum, who have produced, in a handy form, this excellent memoir.

Volume III. of the new edition of **A. Thorburn's** well-known **British Birds** has been issued by Messrs. Longmans, Green & Co. (x.+168 pp., 16/- net), and contains forty-eight coloured plates specially prepared for this edition. The present volume deals with the Geese, Ducks, Pigeons, Doves, Plovers, Grouse, Ptarmigan, Pheasant, Partridge, Crane, Great Bustard, and allied species. Among the ducks Mr. Thorburn seems to be particularly happy in depicting the necessary details with remarkable fidelity. His plate illustrating Mallard and Teal is a masterpiece.

**British Spiders: Their Haunts and Habits**, by **Theodore H. Savory**. London: The Clarendon Press, xii.+180 pp., 6/- net. For some time a handbook has been required by students to assist them in their work among British Spiders. Previously, works on this subject have either been too 'popular' or on too general lines; too technical (sometimes merely lists); or, as in the case of Pickard-Cambridge's well-known 'Spiders of Dorset,' practically unobtainable. We, therefore, welcome this thoroughly scientific and useful treatise on the subject, which describes the spiders from all points of view.

**Exploring England**, by **Charles S. Bayne**. London: Messrs. Jarrolds Publishers, Ltd., 216 pp., 7/6 net. This contains a series of the usual articles written for the student of natural history or 'nature study,' and deals with a variety of subjects such as Fields, Hedgerows, Woods, Commons, Streams, Ponds, Waysides and Wastes, Marshes and Moors, The Coast, When the Tide is out, Gardens, etc. The author is a journalist, and, we are informed, he 'has proved and perfected in the hardest of all schools his natural gift for making the subject interesting.' There are several illustrations bearing upon the subjects dealt with.

**Biological Memory**, by **Eugenio Rignano**. London: Kegan Paul, Trench, Trubner & Co., Ltd., vi.+253 pp., 10/6 net. This is a book on entirely new lines. The author aims at an exhaustive analysis of the differences which distinguish living from non-living matter. He accounts for all these differences as the manifold effects of a single quality—Memory. We cannot do better than quote the following extract from Professor MacBride's interesting Introduction: 'We may say at once that although we consider that the theory will require modification in detail, we regard it as an astoundingly successful effort to analyse vital phenomena. If it is not the truth, it at least bears a strong resemblance to what the truth must be. It may be divided into two parts, the biological and the psychological. . . . We cannot refrain from remarking that we consider Prof. Rignano's analysis of mental functions extraordinarily interesting and suggestive, his methods of interpreting reason, attention, and will, in many ways clearer and more convincing than any which we have so far encountered in the writings of other psychologists.'

Two brief years ago **W. H. Hudson: A Portrait**, by **A. Morley Davies**, was published, and already a popular edition has been issued

by Messrs. Eveleigh Nash & Grayson, Ltd. (xiv.+320 pp., 6/-). The book contains photographs of Hudson, of his rooms, facsimile of a letter to Mr. A. Morley Davies, etc. Naturally the book is one which will appeal to all interested in the study of the open air.

A short **Guide to the Dorman Memorial Museum, Middlesbrough**, by **Frank Elgee, Curator** (16 pp., 1d.), has been issued by the Corporation of Middlesbrough. It contains a brief history of the Institution, a catalogue of the contents of the geological, mammalian and other galleries. The museum has also issued half a dozen postcards illustrating its more interesting exhibits.

The British Museum (Natural History) has issued as No. 1a of its Economic Series **The House-fly : its life history**, by **E. E. Austen** (68 pp., 1/-). Though with a slightly different title, this pamphlet is really a second edition of one published in 1920. Considerable new matter has been added, and some of the figures have been re-drawn. A quaint illustration showing the House-fly menace in the Middle Ages, copied from a print dated 1491, is given in this interesting pamphlet.

**The Geology of the Carlisle, Longtown and Silloth District** (Geol. Survey Memoir). London: H. M. Stationery Office, viii.+113 pp., 2/6. There are few more fascinating areas to the student of glacial geology than that covered by this memoir, and many of the new school of glacialists obtained their first lessons in this charming district. The area is also well-known on account of the development of the new red sandstone, and here again much interesting information is given. It may be because the reviewer has pleasant recollections of the area covered, and is, therefore, prejudiced; but he must admit that a perusal of this memoir has been more fascinating than usual. The area has recently been surveyed by a number of members of the staff of the H. M. Geological Survey, who have also prepared this memoir. It is well illustrated by photographs and maps.

**A Wild Animal Round-up**, by **William T. Hornaday**. London: Charles Scribner's Sons, xii.+372 pp., 21/- net. Buffaloes, grizzly bears, crocodiles, elephants, caribou, moose, musk-ox and the mountain lion are the chief themes dealt with in this extraordinarily well-illustrated volume. The author evidently has had practical experience as a naturalist, and some of his illustrations represent triumphs of the taxidermist's art.

**The Worship of Nature**, by **James George Frazer**. London: Macmillan & Co., Ltd., xxvi.+672 pp., 25/- net. Our readers will no doubt recollect that Sir James Frazer had the privilege of delivering the Gifford Lectures before the University of Edinburgh in 1924 and 1925. In the present volume is the gist of these twenty lectures, together with much additional matter bearing thereon. His chapters deal with The Worship of the Sky among the Aryan Peoples of Antiquity; Among Non-Aryan Peoples of Antiquity; Among the Civilized Peoples of the far East; In Africa; The Worship of Earth Among the Aryan Peoples of Antiquity; Among Non-Aryan Peoples of Antiquity; In China; In Modern India; In Africa; In America; The Worship of the Sun Among the Aryan Peoples of Antiquity; Among the Non-Aryan Peoples of Antiquity; In Modern India; In Japan; In Indonesia. In addition the author gives a wonderful summary of the contents of each chapter, which at once indicates the fascinating nature of this most scholarly volume.

**Plain Speaking**, by **T. R. R. Stebbing**. London: T. Fisher Unwin, Ltd., 218 pp., 7/6 net. Not long ago the present writer had the privilege of hearing a Presidential Address by the author of this work, who happens to be a sound scientist, a Darwinian, and a clergyman. Some of the so-called scientific members of the audience protested against the nature of the address, as being profane! whereas Mr. Stebbing was merely drawing attention to some of the absurdities which had to

be met by those who believed literally in what was stated in the Bible. In the present volume the author reprints various notes from *The Nineteenth Century*, *The Hibbert Journal*, *Blackwood's Magazine*, etc., and we can thoroughly recommend it to all broadminded readers. Among the subjects dealt with are Curiosities About Crustacea; What to Believe in Science: Teleology or Evolution; Thaumaturgy in the Bible; More About Miracles; Voices and Visions: Heaven and the Sky; Wolves and Wild Boars in Modern France; The Origin of Language; 'Blood and Fire and Vapour of Smoke': An Apologia.

**Clay and what we get from it**, by **Alfred B. Searle**. London: The Sheldon Press, vii.+178 pp., 3/6 net. The author deals with the various methods adopted for utilising clay in its different forms for the benefit of mankind. His illustrations indicate ancient and modern forms of brick-making, china, tiles, etc.

**The Story of a Red Deer**, by **Hon. J. W. Fortescue**. London: Macmillan & Co., x.+144 pp., 21/- net. This charmingly illustrated volume contains a delightful narrative of the incidents in the life of a red deer, and stories of his companions on the wild moors. The volume was first published in 1897, but with the coloured and black-and-white illustrations, most of which are exceptionally fine, it is practically a new publication, and we are glad to recommend it.

**Clouds and Weather Phenomena**, by **C. J. P. Cave**. London: Cambridge University Press, x.+29 pp., 5/- net. The President of the Royal Meteorological Society has produced a useful little volume for the benefit of 'Artists and other Lovers of Nature,' and certainly the magnificent photographs of cloud phenomena reproduced at the end of the volume illustrate a marvellous variety of clouds and of various atmospheric conditions.

**Two Ornithologists on the Lower Danube**, by **H. Kirke Swann**. London: Wheldon & Wesley, 67 pp., 5/- net. Mr. Kirke Swann and Mr. J. H. McNeile have taken a journey to Dobrogea and the Danube Delta and have produced this little volume as a memento, the letterpress being by Mr. Swann, and the photographs by Mr. McNeile. There is a chatty description of the trip, and at the end is given a systematic list of the birds observed.

**Animal Life in the Sea**, by **R. J. Daniel**. London: Hodder & Stoughton, 119 pp., 5/6 net. Mr. Daniel gives a fascinating account of the more exciting aspects of marine life, and figures and describes the monsters and monstrosities to be met with, particularly in the deeper waters. He has also gathered together an early collection of prints of sea-serpents and other mysterious monsters, and reproduces some of the quaint representations of marine animals destroying ships, some of which are from 'Historia de Gentibus Septentrionalibus,' of 1555.

**The World in the Past**, by **B. Webster Smith**. London: F. Warne & Co., Ltd., xii.+355 pp., 10/6 net. We have frequently referred to the excellence of the handbooks produced by Messrs. Warne. The present volume, besides containing over 350 pages of well written matter, includes 260 illustrations, 73 being in colour. These show the more remarkable of the forms of extinct animals; landscapes, ancient and modern; geological maps and diagrams, and so on. It is a book that can be thoroughly recommended as a present for anyone having a liking for the study of nature.

**Crystalline Form and Chemical Constitution**, by **A. E. H. Tutton**. London: Macmillan & Co., xii.+252 pp., 10/6 net. This volume is based on a course of lectures delivered last year at the Cambridge University. An attempt is made, however, to render it more generally suitable, not only for students of Chemistry, Physics, Physical Chemistry, and Mineralogy, but for a wider circle of readers, by the inclusion of a preliminary chapter in which the essential facts of pure

Crystallography are very concisely summarised, in order that those readers who have not hitherto studied the subject may be provided with the minimum knowledge regarding the nature of crystals and crystal structure, including the latest development of the analysis of crystals by X-rays, which is necessary for a proper comprehension of the relations between crystal form and chemical constitution. The student will appreciate the wealth of illustration, which go a long way towards simplifying a very difficult study.

**Soils and Fertilizers**, by A. J. MacSelf. London: Thornton Butterworth, Ltd., 224 pp., 6/- net. By the aid of three coloured plates and eight half-tone plates the author gives practical information as to the mode of gardening by strictly scientific methods, though in a popular manner. Drainage, the nature of various soils, gravels, insects and other pests being thoroughly dealt with. The coloured plates of garden pests are remarkably well done, and we can thoroughly recommend the volume to those interested in gardening, amateur or professional.

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**Little Owl in North Lancashire.**—A Little Owl was shot in the grounds of Wennington Hall during the breeding season of 1924, when it was presumed to be nesting. It is now in the possession of Dr. Fred Hogarth, of Morecambe, where I have seen it. It is a fine specimen, and, judging from its size, is a female. Wennington is in Lancashire, but is only just over the West Riding border.—H. B. BOOTH.

**Toothwort in North Derbyshire.**—*Lathræa squamaria* L. has already been reported from various places in Derbyshire, but not as a rule commonly. We have recently noted it in several localities and in considerable quantity. On the roots of hazel it occurs near Ford, at Ashford, and in Monsal Dale, and on the roots of sycamore in Great Shacklow Woods. On this last host the clumps were much larger and the flower spikes much more numerous than on the more usual host, the hazel. One such clump, seen on April 9th, extended over an area of four feet square, and showed 130 spikes of flowers already expanded, numerous others not having then appeared above ground. A second group in the same wood included 106 emerged spikes.—J. M. BROWN and J. S. TURNER, Sheffield.

**Yeovilian Ammonites on the Yorkshire Moors.**—During the excursion of the Yorkshire Geological Society to Castleton on May 2nd, further specimens of the ammonites recorded from the exposures at Little Fryup and Great Fryup Heads in my article in *The Naturalist* for February, 1926, were found on the same horizons in these exposures, and, in addition, the following, which Dr. Spath has identified:—(1) An *Alocolytoceras* of the *germaini* group in the Little Fryup quarry (*dispansum* zone); (2) A young *Hammatoceras*, on the same horizon as *Phlyseogrammoceras* in the Yew Grain exposure, Great Fryup Head. *Hammatoceras* is not included in Mr. Buckman's list in the Whitby Memoir of the Geological Survey, and this would appear to be the first record from Yorkshire.—W. E. F. MACMILLAN.

## PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Mr. W. S. Laverock favours us with a copy of his paper on 'Biology and the Man in the Street,' reprinted from *The Proceedings and Transactions of the Liverpool Biological Society*, Vol. XXXIX.

The Fourth Annual Report of the *Worthing Archæological Society* has an illustration of some bones of Iguanodon found at Southwater, described by Mr. C. H. Goodman, which have been presented to the local museum. The Committee's report gives an account of its excavations and activities in the way of preserving ancient monuments.

*The Transactions and Proceedings of the Perthshire Society of Natural Science* are largely occupied by a Catalogue of the Conchological Collections in the Perthshire Natural History Museum, which is accompanied by a number of plates. Mr. John Ritchie gives 'Museum Notes'; G. F. Bates, 'Reproductive Processes in Algæ'; W. Malloch refers to the 'Development of Freshwater Fisheries' (with plates); and there is an 'Abstract of Meteorological Observations.'

The 102nd and 103rd Reports of the *Whitby Literary and Philosophical Society* have been issued in one cover, and as frontispiece is a portrait of the late J. T. Sewell, J.P., who was such a staunch supporter of the society and its work. There is a healthy list of additions to the museum, both by gift and purchase. Mr. F. Snowdon gives notes on local occurrences of important birds and fishes, and Mr. T. H. Woodwark contributes an interesting account of the Quakers of Whitby. Both Mr. Woodwark and the society are to be congratulated on the value of these local contributions to history which appear from time to time.

*The Annual Report of the Yorkshire Philosophical Society* for 1925 is to hand, and besides the usual record of the Society's work there are notes on 'Woodcocks carrying their Young,' by W. H. St. Quintin; 'Rare and Curious Stone Implements in the York Museum,' by W. E. Collinge; 'Wild Cat and Pine Marten,' by C. E. Elmhirst; 'Roman Bronze Lead-pouring Ladle,' by W. E. Collinge (though the evidence for its Roman date is not given); and the Rev. A. Raine gives 'The York Roman Excavations, 1925,' with illustrations. The two different sets of paging causes a little confusion in quoting references to the report.

Unlike most of us, the *Annual Report of the British Association* seems to become thinner and thinner, year by year. The report for 1925 is, we believe, the smallest published since the formation of the British Association nearly a century ago. Notwithstanding the fact that in our particular copy the printer has endeavoured to swell the volume by inserting extra pages in the Botanical Section, relating to Psychology and other similar topics, the record of the addresses delivered and work accomplished at the Southampton meeting is an admirable one, and the Secretary is to be congratulated on the promptness with which the volume appears. We still hope to see the day when it will be possible to have it issued in the same year that the meeting takes place.

*The Report of the Marlborough College Natural History Society*, No. 74, which covers the year 1925, is a sound scientific publication, and a credit to any scientific Society. There is a lengthy and well-illustrated paper on 'Cyclops of the Marlborough District,' by Mr. A. G. Lowndes. Other papers include 'The Manor of Rockley,' by H. C. Brentnall; 'Cow Bridge: The Risings of the Rockley Bourne,' by L. G. Peirson; 'Some Omissions in the Handlist of Flowering Plants (1919),' by E. W. M. Magor; and 'Fungi,' by C. P. Hurst. There are also full details of the field days, work of the various sections, short notes, meteorological observations, and so on. The report comprises 130 pages and several plates. We notice that appeals to the Society's Treasurer with the object of improving the Society's Library have been without avail, as he has had an eye to audit! Should any of our readers have spare works on Natural History likely to be useful to the Society, they might do worse than send them on.

## NEWS FROM THE MAGAZINES.

The spring number of *Bird Notes and News* contains R. W. Hole's prize essay on 'The Little Owl.'

Professor J. L. Myres has an interesting paper on 'Wayside Geography' in the Spring Number of *The Geographical Teacher*.

Arthur Sharp writes on 'Folk-lore about the Cuckoo,' and W. S. Berridge on 'The Weasel,' in *The Animal World* for April.

In *British Birds* for May, Mr. G. Pye-Smith records having himself taken the nest and eggs of an Icterine Warbler in Wiltshire.

H. S. Gladstone has an illustrated article on 'White Wild Geese,' and W. M. C. Miller writes on 'Blowfly Maggots' in *The Scottish Naturalist*, No. 158.

The Spring Number of *The Amateur Aquarist* deals with 'School Aquaria,' by W. H. Spreadbury; Dangerous Infusoria; Aquatic Leeches; Catfish; Foraminifera; Freshwater Molluscs, etc.

The March *Bulletin of the Russell-Cotes Art Gallery and Museum, Bournemouth*, contains an illustrated description of 155 Palæolithic and Neolithic implements recently lent to the museum by Mr. G. H. Burt.

In *The Animal World* for May, Clifford W. Greatorex in a note on 'Our Friend the Toad,' does not agree with Shakespeare, and says that the toad is neither ugly nor venomous, and he has no such thing as a priceless jewel in his head!

Mr. W. H. St. Quintin gives some useful notes on a Great Bustard which had been in his possession for 28½ years, and some valuable information on the feeding and rearing of these interesting birds, in *The Avicultural Magazine* for May.

*The Journal of the Ministry of Agriculture* for March contains 'The Growing of Lucerne,' by C. Heigham; 'The Welsh Mountain Pony,' by T. A. Howson; 'Observations and Experiments on Apple Scab in East Anglia,' by F. R. Petherbridge and W. A. R. Dillon Weston; and 'Recent Investigations on Silver-Leaf Disease,' by F. T. Brooks.

No. 2 of *Word-Lore: The 'Folk' Magazine* has appeared, and seems even more interesting than No. 1. Among the many contributions are those on Plant Signs; Seasonal Phases; Woden's Dyke; Flowers in Devon; with notes, queries, answers, etc. The publication appears to have taken its place, and its success seems assured.

Among the contents of *The Journal of the Ministry of Agriculture* for April are 'The Bee Research Institute at Rothamsted,' by D. Morland; 'The Control of Apple Scab,' by N. B. Bagenal, W. Goodwin, E. S. Salmon, and W. M. Ware; 'The Control of the Apple Capsid Bug,' by F. R. Petherbridge and W. G. Kent; and 'Chrysanthemum Eelworm,' by K. M. Smith.

*The Vasculum* for April includes many notes on Diptera, Hymenoptera Aculeata, Bees, etc.; 'British Birds far afield,' by E. L. Gill; 'Entomological Notes from the North Tyne,' by J. Murray; 'A Study on the Sex of Flowers in Campions and Catchflies,' by K. B. Blackburn; 'Some interesting Salt-marsh or Maritime Gall-mites,' by R. S. Bagnall; 'Mid-Tyne Phenology: and Field Notes on the Rough-legged Buzzard,' by H. M. S. Blair.

*The Journal of the Imperial Fisheries Institute of Japan*, Vol. XXI., Nos. 3 and 4, contain the following interesting notes, in English: The Pelagic Eggs and Larvæ of Fishes in the Tateyama Bay, and also on the Coast of 'Hokuriku'; Comparison of the Meats of harder and softer Shell Crabs; Influence of Cooking Water on Crabs' Meat; On the Shoal of Fishes crowding toward a Lamp; On the Fertilizing of *Ostrea circumpecta* Pilsbry; On the Rudiments of Gonad of *Ligyda exotica*; and Effects of Temperature and Salinity on the Development of the Ova of a Marine Fish, *Calotomus japonicus*.

## NORTHERN NEWS.

Dr. R. E. Mortimer Wheeler, Director of the National Museum of Wales, has been appointed Keeper of the London Museum.

Dr. J. J. Simpson, head of the Department of Zoology at the National Museum of Wales, has been appointed Director of the Museum at Liverpool.

Sir Henry Miers, the Vice-Chancellor of the University of Manchester, has been elected a Trustee of the British Museum in the place of the late Dr. W. Bateson.

We have received a pamphlet of 23 pages on *The Study of Vegetation*, by E. P. Farrow, which is sold on behalf of the Blakeney Point Laboratory National Trust (Blackie & Son, London, price 2/-).

A portrait of Mr. Henry Preston, F.G.S., was presented to Mr. Preston at the Guildhall, Grantham, recently, in recognition of his services in connection with the founding and formation of the Museum there.

The British Museum publication entitled 'Instructions for Collectors, No. 7, Blood-sucking Flies, Ticks, etc.' by E. E. Austen, has now reached a fifth edition, which has been revised and enlarged (28 pp., 6d.).

The Yorkshire Conchological Society is holding a meeting at York on the 5th June, and particulars can be obtained from the Hon. Secretary, Mr. J. R. Dibb, 'Barrule,' King George Avenue, Chapel Allerton, Leeds.

The Dunstable Library and Museum has issued its First Annual Report (1925-1926), which unfortunately is in the somewhat inconvenient quarto size. It contains illustrations of the more important objects in the Museum, all of which, however, could easily have appeared on 8vo paper.

The Rev. Ernest E. Crake, the rector, has published 'The Parish Registers of S. Giles' Church, Scarthoe, Lincolnshire, 1562-1837,' and in addition to the very useful record contained in the registers themselves, there are valuable historical notes relating to the township, the church, church-plate, etc. There are also some useful illustrations.

In a well-known window in Piccadilly recently was a label with the words 'Live Terrapin from which our Terrapin soup is made.' After waiting while the crowds rolled by, we found the 'Terrapin' were the ordinary turtle, very still, very wooden, with opercula of a gasteropod for eyes. Yet hundreds of people stopped to see those 'live Terrapin.'

During the discussion of a paper read at a recent meeting of the Geological Society of London, Mr. R. A. Smith remarked 'on the occurrence of Cave-period types [of implements?] on the surface, which was a warning to those who regarded all surface finds as neolithic.' We did not know that anyone had made such a statement; what we do object to is the way in which certain 'authorities' describe so many implements as palæolithic from their general outline, regardless of the conditions under which they were found, or of the contemporary fauna.

In view of the excessive cost of printing and blocks, the Editor and the British Ecological Society are certainly to be congratulated upon the excellence of their Journal, the February number of which has recently been issued, and we feel sure that the value of the papers warrants the slight additional charge. The Editor and R. S. Adamson continue their 'Studies of the Vegetation of the English Chalk,' in this case giving a Preliminary Survey of the Chalk Grasslands of the Sussex Downs; F. M. Haines gives 'A Soil Survey of Hindhead Common'; H. H. Allan describes 'Epharmonic Response in Certain New Zealand Species, and its Bearing on Taxonomic Questions'; Blodwen Lloyd, 'Character and Conditions of Life of Marine Phyto-plankton'; H. C. Hansen, 'The Water-retaining Power of Soil'; Margaret Benson and Elizabeth Blackwell, 'Observations on a Lumbered Area in Surrey from 1917 to 1925'; N. Stayanoff, 'On the Origin of the Zerothermic Plant elements in Bulgaria'; W. H. Pearsall, 'Soil Sourness and Soil Acidity.'

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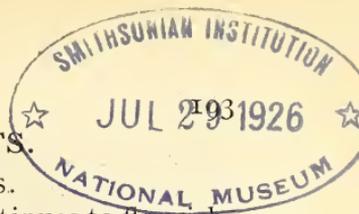
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## NOTES AND COMMENTS.

### SOUTH-WESTERN NATURALISTS.

The South-western Naturalists' Union continues to flourish, and we congratulate it upon the issue of the third *Annual Report and Proceedings*. It is to be regretted that Mr. C. Hunter, M.Sc., who worked so hard for the achievement of south-western naturalists' co-operation and the foundation of the Union, has been obliged to resign the editorship of the Union's publications owing to ill-health. The report contains abstracts of addresses by the President, Dr. E. J. Allen, F.R.S.; 'The Habits of Some Marine Annelids,' Dr. H. B. Guppy, F.R.S.; 'Some Problems of Plant Distribution,' the Rev. Canon E. P. Knubley, M.A., and others. Membership continues to increase, and fifteen scientific societies and public bodies are affiliated.

#### CANON E. P. KNUBLEY.

Canon Knubley, the first President of the Zoological Section of the S.W. Naturalists' Union, is one of the oldest members of the Yorkshire Naturalists' Union, and more than 30 years ago, during his residence in this part of the country, he filled with conspicuous efficiency the unenviable duties of Honorary Secretary of the Yorkshire Union. In the report referred to, he says: 'New problems are constantly arising which call for solution not only with regard to events and processes in the life-history of separate species, but in their inter-relation with other and dissimilar species, whereby the balance of nature may be maintained or disturbed. In these cases economic problems arise as to the beneficial action or harmful effect of almost every species of the animal kingdom on the growing crops, on the flocks and herds and on the harvest of the sea. Naturalists should be ready, in the case of these dissimilar links in the chain of causation, to point out which members of these antagonistic sequences, these disharmonious combinations are helpful or harmful to, the husbandman, the forester, the orchardist, the horticulturist and the fisherman. Take cases such as these from among hundreds of others: (1) the gourmet, the lapwing, the water snail (*Limnæa truncatula*), and the liver-fluke of sheep (*Distoma hepatica*); (2) the herbage of the farm, the short-tailed field vole, and the short-eared owl; (3) The forest trees, the chafers, the moles, and the bats; (4) the pastures, the leather-jacket, the starling and the strawberry and pear crops; (5) The rose, the green-fly, and the ladybird. Then again, problems arise through the silting up of estuaries or from coast-erosion, with their effects on the spawning-ground of various species of fish, and the beds of many kinds of molluscs. Changes, too, are brought about in the character and health of the fauna through river pollution, land drainage, and the

processes of agriculture. There is abundant material all around awaiting the keen eye and practiced hand of the trained observer.' These paragraphs contain suggestions which some Yorkshire naturalists are already carrying out, and which all would do well to take to heart.

#### NEWCASTLE NATURALISTS.

Our Newcastle friends are to be congratulated upon the appearance of Part II. of Vol. VI., New Series, of *The Transactions of the Natural History Society of Northumberland, Durham and Newcastle-upon-Tyne*. Notwithstanding the cost of printing, the Society manages to issue a substantial publication containing valuable contributions to the natural history of its sphere of work. Among the useful memoirs are: 'The Crustacean Fauna of a salt water pond at Amble, with some remarks on its bearing on the problem of the Inheritance of Acquired Characters,' by A. Meek; 'Some Crustacean Larvæ from the Northumberland Plankton,' by O. M. Jorgensen; 'Fossil Flora of the Northumberland and Durham Coalfield,' by Edith Bolton; 'Fluctuations in Fisheries,' by B. Storrow; 'On Parthenogenesis originating in Lepidopterous Crosses,' and 'Variation and Hybridity in Willows,' both by J. W. H. Harrison; 'On two specimens of Giant Squid stranded on the Northumberland Coast,' by A. Meek and T. Russell Goddard; in addition to which there are reports of the Field Meetings held during 1921, 1922, and 1923, by J. W. H. Harrison, F. C. Garrett, and J. R. Johnson respectively; and an Obituary notice of the late David Woolacott, D.Sc., with portrait, written by Dr. J. A. Smythe, who also gives a list of Dr. Woolacott's publications.

#### MELANISM IN LEPIDOPTERA.

The question of Melanism in Lepidoptera is one which is of peculiar interest to northern naturalists. In the *Entomologist's Monthly Magazine* for May, Mr. G. T. Porritt has an interesting contribution to this subject, having reference to Drs. Harrison and Garrett's paper printed by the Royal Society. In *The Entomologist* for the same month Dr. Harrison gives 'Miscellaneous Observations on the Induction Incidence and Inheritance of Melanism in the Lepidoptera,' so that our readers have an opportunity of reading two authoritative contributions to this subject. We take the liberty of quoting from the beginning and end of Mr. Porritt's contribution, but must refer our readers to the Journals mentioned for further details.

#### MR. G. T. PORRITT'S VIEWS.

'Drs. J. W. H. Harrison and F. C. Garrett recently submitted a paper to the Royal Society, which is published in the Proceedings of that Society, Series B. Volume

XCIX., 1926, pp. 241-263. As the paper is likely to be seen by comparatively very few lepidopterists, it seems advisable that some comment on it should appear in a purely entomological journal. Briefly, the authors' theory is that Melanism is caused by the larvæ, when feeding, assimilating metallic salts which have contaminated the food-plants, through their deposition on the plants from smoke in manufacturing and urban districts; and it occurred to them that, by introducing such salts into the water in which they placed the stems of the twigs containing the foliage on which the larvæ fed, similar results might be obtained. The salts they used for the impregnation of the water were lead nitrate and mangano sulphate, and the species chosen for the experiments were *Selenia bilunaria* and *Tephrosia bistortata*. Of the former they state that no melanic form has ever been found wild, and melanic forms of *T. bistortata* (the old *crepuscularia* of our cabinets) have only been reported from Wales. In four years time they succeeded in obtaining black strains of both species. Moreover, larvæ from the black strains, afterwards fed from the egg again on pure food, still produced melanic specimens, thus confirming their anticipation that the induced Melanism was not only inherited, but inherited as a Mendelian recessive (p. 254).

#### ARTIFICIAL MELANISM.

'The paper is no doubt interesting and valuable as showing that Melanism can be induced by artificial means, but there are so many contradictory anomalies in connection with the subject that I think I shall be able to show that lepidopterists generally will require a good deal of further explanation before they can admit that the authors have advanced (if at all) our knowledge of the real cause or causes of Melanism in nature by more than a very small amount.

#### CAUSES OF MELANISM.

'There may possibly be more than one cause of the phenomenon of Melanism, and the theory of Drs. Harrison and Garrett is at any rate as plausible as any of the several that have been advanced, and a considerable advance on the earliest, that it was caused by the elimination by birds of the pale forms on the smoke-blackened trunks of trees, the darker specimens escaping owing to their less conspicuousness, a theory to which I could never subscribe. But when one finds so many instances of Melanism in districts where the atmosphere is perfectly pure, and the comparative paucity of cases, so far as our knowledge extends, in other districts, such as some parts of Staffordshire, Warwickshire, and South Wales, where there is possibly more dense smoke deposited on the vegetation than there is even in South Yorkshire and

the industrial parts of Lancashire, I cannot feel that as yet we really know much more about its cause in Nature than we did fifty years ago.'

#### CAMBRIDGE AND HOLDERNESS GRAVELS.

At a recent meeting of the Geological Society of London, Prof. J. E. Marr read a paper on 'The Pleistocene Deposits of the Lower Part of the Great Ouse Basin.' In the course of the discussion Mr. G. W. Lamplugh asked how the correlation of the supposed marine gravels of March with the river-deposits now described had been reached. He had not himself chanced upon a good section of these gravels either at March or at Chatteris; but, from their characters, contents, and mode of occurrence, he regarded them as the equivalents of those of Kelsey Hill in Holderness, which he knew well and had sought to explain as glacial outwash material. He suggested that the Cambridge sequence of river-deposits may have been formed while an ice-sheet still persisted in the North Sea basin, and was contemporaneously shedding some of its burden over the country east of the Yorkshire and Lincolnshire Wolds. He deprecated the assumption that, because some of the beds contained a 'temperate' fauna, the ice had all gone. There was much evidence that ice-sheets held the sea-basins east and west of this country during times when the low Midlands were bare, and he thought that, in our latitude, the climate during most of the year may then have been comparatively mild. Extreme cold was not favourable to heavy precipitation, and the Pleistocene ice-sheets, even more than those of the northern Polar regions of the present day, must have depended for their sustenance upon the excess of snowfall, and not upon an intense severity of cold.

#### LINKS WITH A LYNX.

According to the press, a cave has been found near the Peak in Derbyshire, in which the Rev. G. H. Wilson 'and helpers proceeded to cut out blocks of this hard deposit with hammer and chisel, and after about three hours' difficult work the almost perfect skull of the exceedingly rare Pleistocene animal, the lynx borealis (a giant wild cat), was discovered. "Before we completed the work in this section," said Mr. Wilson, "what I believe to be the most complete remains of the lynx found in the British Isles have been assembled." The remains were sent to the South Kensington Museum. One of the highest authorities has stated that the lynx probably became extinct when Britain was cut off from the mainland by the North Sea, which various authorities put at any date between 50,000 and 120,000 years ago.' Some margin!

## FEEDING A ZOO.

*The Annual Reports of the Council and Auditors of the Zoological Society of London, 1925,* give some remarkable figures and statistics. The quantity of food alone consumed by the animals is amazing, and includes such items as 157 tons of hay, 106 cwts. of rice, 608 lbs. of Quaker Oats, 45 tons of fish (a walrus alone requiring  $2\frac{1}{2}$  tons of cod), 1825 pints of shrimps, 441 horses, 14,500 tins of condensed milk, 252,000 bananas, 744 lbs. of treacle, 23,000 eggs, and 468 lbs. of Ant-eggs.

## THE SPORTS OF NATURE.\*

In his Preface the author states: 'I had ventured into the backwoods of Palæolithic Man—a wandering boy, who knew not whither he was going, nor what he would find; but his aroused interest carried him along, through regions into which maturer years gave men neither desire nor the power to follow. He formed a collection!—"of merely angular pieces of flint!" said the good friend the Woodwardian Curator. Others said: "Simply the result, as we all know, of Nature's gravel-making"; "Your flints are too absurd for any sane person to take the least interest in!" "It is nothing less than impudence for you to trouble us to look at such meaningless fragments!"' It is a pity the advice given to him in his childhood was not accepted, as this book would not then have appeared. He has figured a large number of pieces of irregular shaped flints 'from glacial and later gravels which exist under Cambridge, under the buildings of the University, under the feet of men who constitute that illustrious and learned body.' He further states that 'when they are as common in some of the gravels of the Cam Valley as daisies in a summer meadow, and when I have collected them for sixty years, the calling them accidental fragments seems like sacrilege. Of the ten illustrated, three or four were culled from gravel in the Pepys' Court of "Maudlin" College, two from paths in Trinity, and two from King's. I might have found twenty times that number had I devoted more time to them.' Sacrilege or not, in our opinion not a single specimen figured in the book is the work of human hands, and when oddly shaped flints are illustrated as pieces of flint 'sculpture,' in one case is even figured a photograph and a drawing of the same object, and another said to be the head of a 'baboon,' and still another a 'copy of oyster shell' (this obviously the result of a conchoidal fracture), the matter becomes almost pathetic. We can, however, congratulate the author on finding a publisher to produce

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\* 'Prehistoric Man and the Cambridge Gravels,' by Rev. Frederick Smith. Cambridge: W. Heffer & Sons, viii.+121 pp., 7/6 net.

his serious account of 'The Sport of Nature, aided by blind chance, rudely to mock the works of toiling man.'

A YORKSHIRE NATURALIST.\*

'I was born on January 2nd, 1862, at Thwaite, in Swaledale, a pretty valley running like a cart-wheel rut between the silent fells of the Pennine Range in the North Riding of Yorkshire. I come of yeoman stock, and, I imagine, possess a fair share of the vices and virtues of that sturdy folk. Originally my family name was De Kerdistan, but some sensible forbear very wisely planed it down to its present simplicity and thereby earned the everlasting gratitude of one of his descendants, at any rate. Members of my family have been landowners, parsons, doctors, schoolmasters, soldiers, sailors, farmers, gamekeepers, miners, and a score of things besides, so that I think I can justly claim to be a man of the people. My forbears have been landowners in Swaledale since 1350, and I have the honour of possessing a pathetic acre or two of their ancient estates.' So begins Mr. Kearton in his volume, which has his photograph as frontispiece. He gives early recollections, accounts of his experiences as a lecturer, illustrations of his methods of hiding during photography, adventures and humours of travel, etc.

A NEW PHYLUM?

In his Catalogue of the Machæridia (Turrilepas and its allies) just issued by the Trustees of the British Museum, Mr. T. H. Withers has dealt in a masterly fashion with these obscure Palæozoic fossils. It is not given to many men to come to the conclusion, after prolonged study, that he is dealing with an entirely new group of animals. Mr. Withers holds that they have nothing to do with the Cirripedes, and their only affinity to the Echinoderms consists in an ornament similar to that on the Anomalocystidæ, and that the plates when broken across show a distinct crystalline cleavage. Hence he cautiously refers them to a new group. The book (100 pp.) is a model of what such a book should be, written in terse, clear English, each genus and species is plainly diagnosed, its type given, distribution, structure, comparison with other forms, and material dealt with; all clearly set out. Follows a discussion of the systematic position, a complete and properly quoted bibliography, full index and eight plates. Dr. Bather has written a Preface, in which he states that while interested in the subject for years, 'every observation made and for the conclusions drawn in the main text all the credit is due to Mr. Withers,' and that his share in the work has been to delay the publication ten years rather on the side of caution owing to the difficult nature of the problem.

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\* 'A Naturalist's Pilgrimage,' by Richard Kearton. London: Cassell & Co., xiii.+246 pp., 7/6 net.

## THE CORRELATION PROBLEMS OF THE LOWER CARBONIFEROUS ROCKS.

COSMO JOHNS.

THE Committee which was appointed by the British Association for the Advancement of Science to attempt to obtain agreement regarding the significance to be attached to the Zonal Terms used in connection with the Lower Carboniferous Rocks, has issued its report, and I am indebted to them for a copy. In what follows, I propose to make a short statement of conclusions arrived at in the course of my own investigations, which were interrupted by the war, pending the publication of a more complete report. Before discussing the various important points dealt with in the report, a brief survey of the state of knowledge prior to the work of Wheelton Hind and Arthur Vaughan is necessary.

John Phillips published, in 1836, his famous account of the Mountain Limestone; and he separated the important series of limestones, shales and sandstones which rest on the limestone massif, calling the former the Yoredale series, while the latter received the name of the Great Scar Limestone. This Yoredale series was described, with a measured section from the type locality in the upper end of Wensleydale. The series here is nearly 1000 feet in thickness, and is followed by the Millstone Grit. The base of the series was taken to be the shale under the Hardraw Limestone.

But Phillips also pointed out in the same volume, and illustrated his views in diagram 9, that the limestone of Greenhow Hill, which is one mass, admits partings between its upper members, which, as the beds are traced north, north-west and west, augment in thickness. These split-off beds constitute the lowest limestone beds of his Yoredale series. On the other hand, the limestone beds in the upper part of the Yoredale series fade out or have been removed as they are traced towards Greenhow Hill, and the Millstone Grit rests on the lower Yoredale limestones, which, by the disappearance of the intervening shales and sandstones, have become absorbed in the Great Scar Limestone.

Near the top of the Yoredale series, in the type section, is the important limestone known as the Main, Cam or Great Limestone; the name varies with the locality. Between this 'Main' Limestone, as we shall call it, and the base of the Millstone Grit, there are more limestones, shales and sandstones, which when traced northwards, become increasingly important and much greater in thickness. William Gunn published, in *The Geological Magazine*, 1898, a very

important paper, in which he traced the various members of the Yoredale series over a wide area in the north of England and extended into Scotland, where he identified the Hurlet Limestone as the equivalent of the 'Main' Limestone in the upper part of the type section of the Yoredale series.

Traquair and Kidston had found that the great break in the Fauna and Flora, which, in their opinion, marked the division between the Upper and Lower Carboniferous, took place in the Roslin Sandstone series of Scotland, which is considered to be the equivalent of some part of the Millstone Grit of the north of England. The vertical range of the fossil plants and fishes in the Lancashire and Yorkshire Millstone Grit has not been worked out with sufficient precision to enable a more precise correlation to be made.

Wheelton Hind, a gifted and strenuous worker, then came on the scene, and attempted to apply zonal methods to the Carboniferous rocks, and achieved a considerable measure of success. He worked out in detail a series of zones, and described his Pendleside series with the Culm Fauna. This he found represented in many areas south of the Craven Faults. Unfortunately, he overlooked the work of Phillips referred to above, and assumed that the whole of the limestones in the Yoredale series represented the split-off upper beds of the massive limestone to the south. He, therefore, sought for his Pendleside series above the Yoredales, and failed, thus leaving the problem of correlating the northern and southern developments of the Lower Carboniferous unsolved. Some even questioned whether his Pendleside series could be separated from the Millstone Grit.

Arthur Vaughan, from 1905 onwards, published a series of important papers with a definite system of zones based on the coral-brachiopod fauna, and described the now famous type section in the Avon Gorge. These zones were found to be easily recognised wherever the coral-brachiopod fauna was found in Belgium as in Great Britain.

The present writer, working in north-west Yorkshire, found that the zones of Vaughan, so far as developed, corresponded with those of the Avon section. The base of the Carboniferous as seen in Ingletondale was found to be of  $C_2-S_1$  age. In other parts of the area, owing to the uneven nature of the pre-Carboniferous floor, the base was of later age. But perhaps most important of all, the upper part of the Great Scar Limestone proved to be of  $D_2$  age, and ended where the Yoredale series commences, at about the level of the top of  $D_2$  in the Avon Section.

The coral-brachiopod fauna persisted into the limestones of the Yoredale series. The fauna of the lower of these limestones was found to be of the  $D_3$  age, which had been as-

cribed to certain higher beds which Vaughan had studied in areas distant from his Avon section, and where the Culm fauna of Wheelton Hind's Pendleside series was encountered. *Posidonomya becheri* was the most distinctive fossil of Hind's Culm fauna, though he had used the Cephalopods with success to define his zones.

This fossil had, however, been recorded from the Hardraw shale, the very base of the Yoredale series. This was confirmed by the writer and Hind, and then, as an effort to remove the confusion that had arisen, the equivalence of the Yoredale and Pendleside series was claimed. At this stage it is desirable that an error should be corrected, for in that paper the Pendleside Limestone was correlated with the main Limestone of the upper part of the Yoredales. The writer sinned in good company, but does not offer that as an excuse.

As the work progressed, it became clear that the great Yoredale series of Phillips was a most important development of the Lower Carboniferous, represented by a different type of rocks with another fauna in the south of England and abroad, and certainly higher on the time scale of Vaughan's coral-brachiopod zones than the top of his  $D_2$  in the Avon section. A great series reaching nearly 1000 feet in Wensleydale, and nearly double that thickness further north, and probably the greater part of the Carboniferous Limestone series of Scotland, could not be left as representing a sub-zone in the nomenclature of Vaughan.

For these reasons the writer, in 1910, proposed a new classification of the Lower Carboniferous rocks, making the Yoredales a major division comparable in importance with the Viséan and Tournaisian, and used the term Yoredalian for this the highest division of the Lower Carboniferous. It was defined as the time interval represented by the Yoredale series of Phillips, with the entrance of *Posidonomya becheri* as its faunal base. Arthur Vaughan tentatively accepted this proposal.

Now comes the very important contribution of Bisat. By means of a critical analysis of the Cephalopoda, carried out with great skill, and using all the available material, he has been able to establish a series of zones in the areas where Hind had worked, but with greater precision, so that it is now possible to attempt, with more than a promise of success, the long sought for correlation between the two so dissimilar regions which, in the north of England, are divided by the Craven system of faults. He defines the genus *Goniatites* (s. str.), and establishes a zone P which covers the range of *G. crenistria*, and probably includes any beds which contains members of the genus *Goniatites*. This zone P corresponds approximately to the Pendleside series, as re-

defined by Vaughan, and certainly includes the well-known *P. becheri* zone of the lower part of his Pendleside series. At the top of this zone P, Bisat finds the break between the Upper and Lower Goniatite fauna, and it is here that he considers that the Viséan ends and his Lancastrian begins. The Lancastrian, which includes the Millstone Grit, he divides into the zones E, H, R and G.

The British Association Committee deals with all this data in a most interesting manner, and though unanimity has been denied them, the conclusions stated in the majority and minority report constitute a very important contribution to our present state of knowledge. The writer is interested, because the majority report recommends the adoption of the term Yoredalian, as denoting a major division of the Lower Carboniferous, with a status equal to that of the Viséan and Tournaisian; while there does not appear to be any serious objection, to this recommendation, on the part of those contributing the two minority reports.

If confusion is to be avoided, it is very necessary to strive for precision in defining Yoredalian as a major time interval, which begins with the entrance of a new fauna sufficiently distinctive for its purpose in the field, and ending with the entrance of another equally distinctive fauna and/or flora. The Committee has made a serious effort to achieve this, so far as the base of the Yoredalian is concerned. They frankly describe the three proposals which came before them for consideration, which may be summarised as follows: (1) the base of the Yoredalian at the top of  $D_3$ ; (2) at the top of  $D_2$ , which would then correspond exactly with the base of the Yoredales as defined lithologically by Phillips, and which corresponds in many places with the entrance of the Culm fauna; (3) at the base of  $D_2$ , for which the only recommendation suggested is that it is a formal line easily mapped in the north of England.

If the present writer be permitted to redefine Yoredalian, in the light of his own experience of the Carboniferous rocks of this county and abroad, he would place its base at the level where *P. becheri* and *G. crenistria* enters. That would be, in the type section of the Yoredales, in the shales below the Hardraw Limestone, at the very base of the Yoredales as defined by Phillips on lithological grounds; and also at the base of zone P, as defined by Bisat, and marked by the appearance of the genus *Goniatites* (s. str.). It is true that  $D_3$  of the coral-brachiopod zones of Vaughan would be included in the lower part of the Yoredalian. As is pointed out in another part of the report, it is the entrance of a new fauna, and not the local persistence of an old one, that determines time divisions in the rocks. The Committee's choice,

evidently made with some hesitation, fell on the top of  $D_3$ , which they recommend for adoption for the time being. Time and the field worker will decide which of the two proposals defines most accurately the dividing line between Viséan and Yoredalian in this country. In the opinion of the writer, the inclusion of the beds with *P. becheri*, and marked by the first entrance of *G. crenistria*, in the Yoredalian, will eventually be found necessary.

The top of the Yoredalian must of necessity coincide with the top of the Lower Carboniferous. As already mentioned above, the great break in the fauna and flora was found to occur in the Roslin Sandstone, which is considered to represent some level in the Millstone Grit of the north of England. The Committee refrains from expressing any opinion on the subject. Phillips, though not always so clear as he usually was, does seem at times to have included all the beds between the Millstone Grit and the base of the shales below the Hardraw Limestone in the Yoredale series. The Geological Survey are quite clear on the point. In Scotland the Yoredalian would, by definition, have as its base the beds with the entrance of *P. becheri* and *G. crenistria*, and would end below the Roslin Sandstone series. It is most necessary that the coral-brachiopod zones, based on the work of Vaughan, should be worked out in greater precision. This can probably be done best in the north of England. At present the goniatite zones of Bisat appear to be the only ones that can be defined with the necessary precision in the Yoredalian. Yet it is most necessary that both coral-brachiopod and the goniatite zones, be available for the use of the field worker, and their relative time values established.

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## REVIEWS AND BOOK NOTICES.

**Fruit and the Fruit Trade**, by Ford Fairford. London: Sir Isaac Pitman & Sons, Ltd., xii.+154 pp., 6/- net. At no time so much as in recent years has the question of fruit and its consumption been so prominent before the British public, and improved methods of packing, preserving and storing have resulted in the most delicate fruits being received from Dominions and Colonies in all parts of the world; and it is now possible to purchase, at a reasonable price, various fruits at almost any season of the year. The present volume deals with several aspects of the question, and is well illustrated.

**The Old Straight Track: Its Mounds, Beacons, Moats, Sites and Mark Stones**, by Alfred Watkins. London: Methuen & Co., xx.+234 pp., 18/- net. In *The Naturalist* for July, 1922, p. 214, we reviewed a pamphlet by Mr. Watkins entitled 'Early British Trackways.' We then pointed out that the author saw guideposts in trees, sighting points in hills, indicators in stones, and leys in everything. Since then the author has continued his theme, and the present work is the result. He has certainly managed to bring together an enormous series of objects, and his maps, upon which these are indicated, rather take away the value

of the author's arguments, as they indicate to what an enormous extent perfectly straight trackways existed in early times, whereas on the face of it, this hardly seems to have been likely. However, we must be grateful to the author for drawing attention to an aspect of archæology worth pursuing, though, as on the previous occasion, we are not converted to his theories.

**Professor J. Stanley Gardiner** has now issued Part 3 of **The Natural History of Wicken Fen** (Cambridge: Bowes and Bowes, pp. 173-266, 5/- net) which contains notes on the Mollusca, Coleoptera, Oligochæta, Thysanura, Hemiptera-Heteroptera, and Hymenoptera Aculeata. T. W. Harris also contributes notes on the 'Flora of the Experimental Pond,' and W. Farren on a 'List of Lepidoptera of Wicken and the neighbouring Fens.'

**Problems of Bird Migration**, by **A. Landsborough Thomson**. London: H. F. & G. Witherby, xv.+350 pp., 18/- net. The author had excellent opportunities for investigating the movements of birds from 1909 onwards in connexion with the Bird Marking method adopted by the University of Aberdeen. Subsequently he has assisted Mr. Witherby's scheme, and many of the ornithological publications have benefited as a result of Mr. Thomson's observations. The first section of the work summarises the principal facts known of bird migration; then are given details of the migration of certain species such as swallow, lapwing, starling, mallard, and gulls. The third section is devoted to a statement and discussion of the main problems of migration. In this he has chapters on the Ends Served by Migration; Factors Determining the Path and Goal of Migration Flight, and similar topics. There are maps and diagrams bearing upon the subject.

**Géologie Stratigraphique**, by **Maurice Gignoux**. Masson & Cie, 120 Boulevard Saint-Germain, Paris VI<sup>e</sup>. vi.+588 pp., price 60 francs. Professor Gignoux à l'aide d'une centaine d'excellentes cartes et d'autres gravures, a donné un résumé dependable de la Géographie Stratigraphique, en comparant les parties du monde l'une à l'autre, et, d'après la partie qui traite de la Grande Bretagne seule, on voit bien que l'auteur a lu beaucoup et avec discernement en poursuivant ses recherches.

Ce n'est point un ouvrage de documentation, et on n'a pas cherché à y être complet. Les faits qui y sont exposés correspondent à peu près aux connaissances les plus élémentaires exigées pour la Licence. En l'écrivant, il a surtout pensé qu'Etudiants, non seulement aux futurs géologues, mais aussi à ceux qui se destinent à une autre branche des sciences naturelles et n'étudient la Géologie que pour développer leur culture générale. Aussi a-t-il cherché ici, au moyen d'un petit nombre d'exemples étudiés en détail, à illustrer les méthodes de travail et les synthèses des Stratigraphes. 'Quand on n'est pas destiné à se spécialiser dans une science, il n'est point nécessaire de se surcharger la mémoire par une documentation dont on n'aura plus à tirer parti; mais, en revanche, il me paraît intéressant de profiter de la valeur éducative propre à chaque discipline: or les synthèses stratigraphiques représentent des constructions logiques d'un ordre tout particulier; et il me semble qu'on ne peut être un Naturaliste complet si l'on n'a pas appris à en pénétrer le mécanisme.'

**Les Oiseaux l'Ornithologie** et ses bases scientifiques, par **M. Boubier**. Paris: Gaston Doin et Cie, 8 Place de l'Odeon. 305 pp., 22 fr. net. Série 'Encyclopedie Scientifique' maintient la qualité des livres déjà parus. L'auteur traite des oiseaux en général de tous les aspects, ayant des chapitres au sujet des becs, pieds, plumage, œufs, squelettes, des particularités d'anatomie, des organes variées, etc., des oiseaux fossilisés, des problèmes géographiques, la migration, la classification, etc. On traite tout d'une façon très pratique, et les chapitres sont très complètement illustrés. Bien que le livre comprenne plus de 300 pages, on peut le mettre facilement dans la poche.

## THE GONIATITE ZONES BELOW THE KINDER SCOUT GRIT IN NORTH DERBYSHIRE.

J. WILFRID JACKSON, M.Sc., F.G.S.

AN attempt is made in this note to give a brief outline of the zonal succession of the goniatites in the beds below the Kinder Scout Grit in North Derbyshire. In a later paper it is hoped to deal more fully with these zones, and the faunal assemblage of each.

The classification of the beds between the Kinder Scout Grit and the Carboniferous Limestone, in the neighbourhood of the Peak, was outlined in this magazine in October, 1923;\* but, for the sake of completeness, the scheme is repeated here with the addition of approximate thicknesses. The details are as follows:—

	Kinder Scout Grit (=Fifth, or Lower Kinder Scout Grit of the Horizontal Section Geological Survey, one inch map, 81 N.E., sheet 69) ...	250 feet.	
Sub-Kinder Series	{	Grindslow Shales ... ..	300 ,,
		Shale Grit ... ..	400-500 ,,
		Mam Tor Sandstones ... ..	200-300 ,,
		Edale Shales with Limestones	750+ ,,

The type section is that across the Edale Valley and Mam Tor to the Carboniferous Limestone, given in the *Geological Survey Memoir on North Derbyshire*, 2nd Edition, 1887 (fig. 12 on p. 45).

The Edale Shales are the chief fossil-bearing rocks, and in the Edale Valley and on the eastern scarp of Mam Tor the following goniatite zones have been met with below the base of the Mam Tor Sandstones:—

Zone.	Locality.	Equivalent elsewhere.
R.1 {	Mam Tor & Edale Valley.	Roughlee
{	„ „	„
{	„ „	„
H. {	„ „	„
{	„ „	Upper Sabden Shales
{	„ „	
E. (upper)	Nuculum & Bisulcatum	Stone Head Beck, etc., near Cowling
	„ „	
E. (middle)	Bisulcatum Edale Valley	Warley Wise Bridge ?
		} Lower Sabden Shales

\* J. W. Jackson, 'On the Correlation of the Yoredales and Pendlesides,' *The Naturalist*, Oct. 1st, 1923, pp. 337-8.

The correlation of the *Bisulcatum*-bed at Edale with the Warley Wise-bed is not so certain, hence the query. The former may lie somewhat higher than the latter, but is well below the zone of *Nuculum* and *Bisulcatum*.

On Mam Tor and Edale, *Eumorphoceras ornatum* occurs at, or near, the junction of the *Reticulatum* and *Inconstans* zones.

Slightly above the *Bisulcatum*-bed is a marine band, with *Anthracoceras glabrum* Bisat, *Homoceras* cf. *nitidum* (Phil.), and a lamellibranch, all of which are characteristic of a band in the Gill Beck Shales at Westfield, near Cowling. This band also appears to be the equivalent of the Colsterdale Marine Band,\* Upper Nidderdale, while the *Bisulcatum*-bed itself contains essentially the same fauna as the marine band at Pace Gate Beck, east of Bolton Abbey.

A little distance below the Edale *Bisulcatum*-bed the shales contain a fauna consisting of *A. glabrum*, *H.* cf. *nitidum*, lamellibranchs, etc., and further below are strong limestone shales with an abundance of *Posidonomya membranacea*, together with *Chænocardiola footii*, *Pteronites semisulcatus*, and imperfect goniatites (not *Pseudobilingue*), including a form with lattice-ornament similar to one from Weston Beck, Otley. The same form has been met with in the marine band at Pace Gate Beck.†

At least 100 feet of shales occur below the *Membranacea* beds at Edale, but the base is not seen.

Though the succession of goniatite zones in the Peak District is quite clear, it is extremely difficult to obtain a reliable estimate of the thickness of strata embraced by them. The upper zones occur within 200 feet from the base of the Mam Tor Sandstones: *Nuculum* is at least 250 feet down from the base: *Bisulcatum* appears to be 250 feet below *Nuculum*; and the lowest shales visible in the Edale Valley are approximately 750 feet below the Mam Tor Sandstones.

It might be pointed out in conclusion that shales containing *Bisulcatum*, and some of the associated Edale forms, occur at, or very near, the unfaulted boundary of the Carboniferous Limestone at Nun Low, near Hope; Bradwell, and Eyam. At Nun Low the shales overstep the zone of *Goniatites crenistria*; at Bradwell the limestones are probably not higher than the upper part of  $D_2$  of Sibly‡; while at Eyam the shales rest on limestones containing *Lonsdaleia floriformis* (=  $D_2$ ). Shales containing *Homoceras* cf. *nitidum* and the Westfield

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\* See L. H. Tonks, *Proc. Yorks. Geol. Soc.*, N.S., Vol. XX., pt. 2, 1925, p. 252.

† This was unknown to L. H. Tonks when his paper (*op. cit.*) was published.

‡ T. F. Sibly, *Q.J.G.Soc.*, Vol. LXIV., 1908.

lamellibranch also occur close to the limestone boundary below Glutton Bridge, near Longnor.

It is unfortunate that the shales overstepping the truncated edges of *Lonsdaleia*-limestones at the Old Mill quarry, east of Youlgreave,\* cannot be satisfactorily dated. So far they have failed to yield anything of zonal importance, as the only fossil seen is a small species of *Posidonomya* reminiscent of a form common in beds associated with the *Bisulcatum* zone at Edale. The section in the quarry is of great interest, as showing discordance in the dip of the two series of strata. If the beds were adjusted so that the shales were horizontal, the limestones would clearly dip inwards to the massif, as would also be the case in the three northern localities mentioned above.

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The Royal Society for the Protection of Birds has issued its *Thirty-fifth Annual Report* (107 pp., 1/-). It contains an excellent record of the Society's various activities.

Among the contents of *The Transactions of the Yorkshire Dialect Society*, recently issued, we notice 'The Place Names of Yorkshire,' by A. H. Smith; 'Some Further Mining Terms from Greenhow,' by H. Bruff, etc.

No. 7 of *The Proceedings of the St. Peter's School Scientific Society* has appeared, from which it would seem that natural history still claims a fair share of attention in the Society's work, though Archæology, etc., is not neglected. We are glad to notice the records of flowering plants, fungi, birds, etc., in the report, as well as useful meteorological tables.

Among the many interesting notes in *The London Naturalist*, the Journal of the London Natural History Society (47 pp., 3/-) for 1925, are, 'Increase in Melanism in the Last Half-Century,' by A. W. Mera; 'On the Occurrence of Certain Ferns in Surrey,' by R. W. Robbins; 'London Birds,' by A. H. Macpherson; 'Changes in the Vegetation at the Black Pond, Esher,' by H. J. Burkill; 'The Greater Spotted Woodpecker,' by J. Ross; and 'The Birds of the Shetland Islands,' by W. E. Glegg.

Vol. XXX. of *The Transactions of the Institution of Water Engineers* contains 'The Presidential Address,' by A. E. Cornwall-Walker; 'The Chesterfield New Waterworks,' by C. Baldrey; 'The Biology of the Jersey Waterworks,' by W. Rushton; 'An Analysis of Scottish Rainfall Records,' by W. N. McClean; 'The Action of Various Waters on Lead and Copper Pipes,' by J. C. Thresh and J. F. Beale; and 'The Afforestation of Catchment Areas,' by J. R. Davidson. The volume also contains a valuable Contents and Subject Index, Vols. I. to XXX.

We have received from Dr. Wilfrid Robinson three valuable papers which indicate the lines upon which his researches are being made. We should like to congratulate him on his work. The papers are: 'On the Proliferation and Doubling in the Flowers of *Cardamine pratensis* L.', reprinted from *The Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, Vol. XXIX.; 'On Some Features of Growth and Reproduction in *Sporodinia Grandis* Link.', reprinted from *The Transactions of the British Mycological Society*, Vol. X., Part 4; and 'The Conditions of Growth and Development of *Pyronema confluens* Tul. (*P. omphaloides* (Bull.) Fuckel), reprinted from *Annals of Botany* for January.

\* Sibly, *op. cit.*, p. 63, and fig. 5.

## YORKSHIRE NATURALISTS AT MALHAM.

EVELYN MUSGRAVE, B.SC.

A FEW members of the Yorkshire Naturalists' Union spent a very happy week-end at Malham this Easter. Mr. Burrell won the gratitude of all by his untiring help in identifying and classifying even the commonest of mosses, most of which were unknown to them.

Specimens were obtained from the walls, streams and rocks up to Gordale Scar; from the peaty bogs of Tarn Moss and the moors *en route* to Victoria Caves. It was suggested that *Thuidium Blandovii*, last recorded in 1868, might be found on Tarn Moss by a lucky and enlightened searcher, but though all were 'enlightened,' thanks to the leader, not one was lucky.

The society was indebted to the owner, Mr. Morrison, who, through his agent, Mr. J. Winskill, allowed the members to visit any part of the Malham Tarn estate, and they therefore visited Tarn Moss two or three times. It is to be regretted that some person not a naturalist had thoughtlessly cut down many of the willows recently planted on the south-west margin of the Tarn.

Malham Cove was visited in order to see the effect of the fall of rock in January of this year. From the road the only indication of the fall is a comparatively small yellow patch on the extreme right-hand side of the otherwise grey surface of the cove, but a nearer view shows that a great amount of rock has fallen and has broken into several pieces, the largest of which was estimated to contain thirty cubic yards, and this block has travelled down the slope leading to the stream, felling one or two trees, scraping the bark off another to a height of about twelve feet, and finally coming to rest on the other side of the stream. Considering the tremendous fall, it is amazing that so little real damage has been done and when the rolling stones are weatherworn and moss grown the cove will be as picturesque as ever.

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**Marvels of Reptile Life**, by **W. S. Berridge**. London: Thornton Butterworth, Ltd., 256 pp., 6/- net. This is another of the publisher's 'Marvel' Series, and is a well-illustrated description of the various forms of reptiles to be found in such places as the Zoological Gardens, the frontispiece being a photograph of a tame Chinese Alligator in the hands of one of the keepers. The photographs are all by the author.

**Practical Microscopy: An Introduction to Microscopical Methods**, by **F. Shillington Scales**. London: Bailliere, Tindall & Cox, ix. + 332 pp., 8/6 net. Dr. Shillington Scales' well-known 'Practical Microscopy,' which has been a handbook to so many students for twenty years, has reached a third edition. Several of the chapters have been largely rewritten and brought up to date, and additional illustrations have been made.

**The Origin of Birds**, by **Gerhard Heilmann**. London: Messrs. H. F. & G. Witherby, 208 pp., 20/- net. Messrs. Witherby are placing ornithologists and zoologists generally under a deep debt of gratitude for the amount of valuable material they are making available for the use of students. The present volume contains coloured plates of Upper Jurassic Birds, and Cretaceous species, as restored by the author, and the descriptions of *Archæornis* and *Archæopteryx*, with the wealth of illustration, will be welcomed by those interested in the origin of bird life. From these primitive forms the author goes step by step, giving well-illustrated accounts of embryonic stages of reptiles and birds, anatomical and biological data, and concludes with an article on the Proavian, etc. The illustrations, and especially those of a comparative nature, are wonderfully complete and informing.

## BRONZE-AGE HOARD FROM EVERTHORPE, EAST YORKSHIRE.

T. SHEPPARD, M.SC., F.G.S.

So long ago as 1842 a collection of bronze axes was found in a gravel pit at Everthorpe, E. Yorks., as was briefly recorded at the time, but until a few months ago all trace of this



collection had been lost. Fortunately it was discovered by Colonel J. B. Stracey-Clitherow, who placed the specimens in the Museum at Hull, but evidently from a note on the lid of the box containing them, other pieces had been found and had been disposed of, one to 'J.C.C.' Enquiries made in the usual channels resulted in no information being obtained of these missing pieces.

On a recent visit to Oxford, however, I noticed three specimens marked 'Everthorpe,' which were evidently part of the missing hoard, in the Ashmolean Museum, and it seems, from information given by Mr. E. T. Leeds, that these were purchased in 1887 in Berkshire soon after the death of the Rev. J. C. Clutterbuck, a well-known antiquary, who had a large collection of bronzes. This was evidently the 'J.C.C.' referred

to on the box containing the major portion of the hoard. The authorities at the Ashmolean Museum have kindly agreed, by means of an exchange, to allow the three in their collection to come to Hull, where once more they have joined their fellows.

The largest piece is a lump of bronze, weighing  $2\frac{3}{4}$  lb., clearly part of a lenticular cake which at one time has filled the lower part of a crucible.

The second specimen is an interesting socketed axe with loop, weighing 8 oz., remarkable for the fact that it has four raised edges extending from the collar downwards, in place of the usual three. It has a good patina. From the illustrations in *The Naturalist* (November, 1923, Plate 3), it will be seen that most of the axes in the Everthorpe hoard are devoid of these ridges. One or two have three ridges rather wide apart, one single specimen has three long narrow ridges equally placed between the edge, giving an appearance much more resembling the present example. The socketed axe just received from Oxford is 4 inches long, is 1 inch square in the centre, wedge shaped, the hollow for the shaft penetrating almost to the cutting edge. The cutting edge is slightly damaged, and is 2 inches in length. The ridges formed by the mould are very prominent, and at the socketed end the ridges are still left where the 'jet' has been broken off. The axe has clearly not been trimmed up in any way since leaving the mould.

The third example, the only one of its kind in the hoard, is a particularly well-preserved gouge of bronze, certainly the finest in the museum collection. There is a distinct collar, half an inch deep, projecting at the socketed end. On the sides are the ridges formed by the mould, and the hollow for the handle extends to within about half an inch of the cutting edge. The socket is circular, is  $\frac{3}{4}$  inch across, and weighs  $2\frac{1}{2}$  oz.

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**Pied Blackbird near Bridlington.**—At Whitsuntide, a party of members of the Yorkshire Naturalists' Union had a fine view of an exceedingly beautiful variety of the Blackbird, just outside the grounds of Marton Hall. It was a male, with the whole of the head, throat and neck apparently perfectly white, and the whole of the remainder of the body perfectly black. The line of demarkation being so well defined made it a very conspicuous object, and it is to be hoped it may escape the usual fate of such birds. Pied male Blackbirds in some form or other are by no means uncommon, but pied females are extremely scarce.—H. B. BOOTH, Ben Rhydding.

## THE DESCRIPTION OF NEMATOCEROUS FLIES, ESPECIALLY CHIRONOMIDÆ.

GEORGE GRACE, B.SC.

(Continued from page 176).

### THE FOOT.

Consists of two curved claws, a median EMPEDIUM, and two (or occasionally four) lateral pads or PULVILLI. The latter are sometimes absent.

The relative lengths of the fore tibia and its metatarsus have long been used to distinguish the two great divisions of the Chironomines. This 'Leg Ratio' (L.R.) is most compactly expressed as a decimal, *e.g.*, in *Chironomus venustus* metatarsus  $\div$  tibia = 1.5. This L.R. is greater than one in the Chironomariæ, and less than one in the Orthocladiariæ, and fairly constant in any one species. Goetghebuer has introduced a further elaboration in the measurement of the legs. He measures the fore tibia and each of the five tarsal segments, and records them as a series of six numbers. This is useful in certain cases, but I have not found it necessary, as a rule, to do more than measure the tibia and first segment.

The hairs on the legs are of two distinct kinds, ERECT and RECUMBENT. When the erect hairs on the fore tarsi are longer than about three times the diameter of the leg the insect is said to be BEARDED or BARBED. The earlier writers, who worked with simple lenses, described those examples which are not bearded as BARE, but, under the microscope, no legs are really bare.

Besides hairs, a number of spine-like SPURS are found which vary so much in the four great groups previously mentioned that it will be best to deal with each group separately.

### ORTHOCLADIARIAN SPURS.

In this group the fore tibiæ carry one spur each, generally longer than the diameter of the leg. The fore tarsi, in the great majority of cases, are without.

The middle tibiæ have each two spurs, generally of equal size, and the middle tarsi have often smaller spurs on the first two or three tarsal segments.

The hind tibiæ generally have two unequal spurs and a row of free spinules. In order to distinguish this row of free spinules from the very different structure found in the Chironomariæ, Mr. Edwards proposes to name it a SIMPLE COMB. Some of the segments of the hind tarsi carry spurs, and as these vary so much in different species they should be

noted. A compact way of recording them is as follows:—  
The spurs of a certain *Orthocladius* are

1—0-0-0

2—2-2-0

1c—2-2-0

which means that the fore leg has one spur on the tibia and none on the tarsi. The mid leg has two spurs on the tibia, and two on each of the first and second segments of the tarsi, but none on the third. The hind leg has two unequal spurs and a simple comb on the tibia, two spurs on each of the first and second segments of the tarsi, but none on the third.

#### DIAMESARIAN SPUR.

The spurs in this group are similar to those described above, but some species have also a row of spines arranged longitudinally on the first and second tarsal segments of the middle and hind legs. As such spines occur in other nematocerous families, they are probably a primitive survival. Certain species have also spurs on the fore tarsi.

#### TANYPININE SPURS.

In the *Orthocladariæ* many of the tibial spurs shew signs of lateral branching on their basal half. Among the *Tanypinæ* this branching becomes much more prominent, and the spurs are a different shape. Otherwise the tibial spurs are as previously described.

In *Tanypus* no spurs are found on any tarsal segment, but *Trichotanypus* has spurs on the tarsi of all three pairs of legs, as in the case of certain species of *Diamesa*.

#### CHIRONOMARIAN SPURS.

These are very different from any previously described. They probably represent extreme specialisation, and, taken with the specialised hypopygium, indicate that this group has been distinct from the other three before the others were divided, although the venation of the wings causes them to be included in the same family.

The fore tibia has no definite spur, but its place is taken by a PROJECTION which is sometimes rounded, and sometimes pointed. The hind and mid tibiæ are ornamented by a variety of scales which are doubtless developed from the spurs and combs of the primitive type. These can be most easily described as built up of four distinct elements which generally occur in pairs.

- (a) An OVAL SCALE with teeth and a median spur, which may be either straight or curved.
- (b) The same scale without the median spur.
- (c) A parallel-sided COMB made of a base and teeth of uniform length. One tooth, generally near the

middle, is prolonged into a spur. Mr. Edwards proposes naming this a FUSED COMB to distinguish it from the comb of the Orthocladariæ, etc.

(d) A similar comb, but without the spur.

These elements, arranged in a definite way, are characteristic of some of the great divisions of the Chironomariæ, e.g. :

In Chironomus, using the name in Kieffer's restricted sense, the mid tibia has two scales of a type *a*, and hence two spurs, and the hind tibia has a scale *a* combined with a comb *c*. It may, therefore, be represented by the formula  $aa - ac$ .

In Polypedilium the mid tibia has a scale of type *a* and comb of type *d*, and the hind tibia the same, except that the comb is longer. The formula, therefore, is  $ad - ad$ .

In Microspectra one of the largest subgenera of Tanytarsus, the formula is  $bd - bd$ .

In none of the Chironomariæ are there any tarsal spurs.

#### THE WING (Fig. 7).

The wings are made of a transparent membrane which is sometimes clear, when it is said to be HYALINE, at other times quite milky, and at others again an intermediate gray. When examined by transmitted light under a low power of the microscope it may be either colourless or brown. Milky wings are always brown, and so also are many which are only slightly grey.

At least three kinds of hair are found on the surface of this membrane.

- (a) MACROTRICHIA, which are visible with a pocket lens, and have annular bases of insertion. When these are present the wing is said to be HAIRY.
- (b) Wings which are not hairy may be covered with MICROTRICHIA or SETÆ ( $2\mu$  to  $10\mu$ ), which are seen as distinct bristles under a magnification, 200 to 300. These wings are described as PUBESCENT.
- (c) When definite microtrichia are absent the wing sometimes shews fine 'dots' ( $\times 300$ ), when it is said to be PUNCTATE. These dots are probably very small microtrichia, and there may be every gradation between punctate and pubescent wings. Punctate wings are milky by reflected light and brown by transmitted light.
- (d) Sometimes the 'dots' are entirely or almost absent, and the wing shews a dappled or VACUOLATED appearance under high magnification, and it is simplest to regard this as a fourth type of wing, though it is not sharply separated from *c*.

When examined by reflected light, especially with a hand

lens, many wings shew an arrangement of dark spots or bands which is very useful in descriptive work.

The part of the wing where it joins the body is known as the BASE, and the opposite end is the APEX. The fore or ANTERIOR MARGIN is stiffened by the COSTA, and the hind or ANAL MARGIN is not so stiffened, but usually bears a fringe of long hairs. There is no definite APICAL MARGIN in dipterous wings as in some others. The enlargement behind the base is known as the ANAL AREA (CLAVUS\*). In some cases, as in many Tanytarsus, the anal area is missing, in others the ANAL ANGLE is a rounded right angle, and in others again the area is extended into a definite ANAL LOBE. Intermediate forms also occur making it difficult adequately to describe many wings in words.

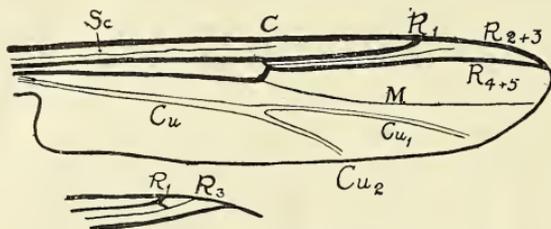


FIG. 7.—Wing of *Chironomus* and portion of Wing of *Tanypus*.

### THE WING VEINS.

Several systems of names have been proposed for the nerves or veins of wings, and, until recently, none of them has met with universal acceptance. It is, therefore, necessary to know something of several systems, and to be able to correlate them.

As the system introduced by Comstock† seems to be steadily gaining in favour, I propose, first, to describe that, and afterwards explain several others.

An examination of the base of a wing will show that the principal trunk veins are six in number.

These are named by Comstock as follows:—

- I.—The COSTA (*C*) which runs along the margin and is never branched.
- II.—The SUBCOSTA (*Sc*) which is rarely branched, and in the Chironomidæ is very faint and unimportant.
- III.—The RADIUS (*R*), which in its most complicated form has five branches. The main stem (*R*) first divides into two (*R*<sub>1</sub> and *R*<sub>s</sub>), and the lower branch afterwards may divide into as many as four distinct

\* Tillyard, *Nature*, November 7th, 1925.

† Comstock, 'The Wings of Insects,' 1918.

branches ( $R_2 . . . . . R_5$ ). Where some of these branches are missing they are regarded as being merged in others and the combined veins are named  $R_{2+3}$ ,  $R_{4+5}$ , etc. In Chironomids,  $R_1$  is distinct  $R_{2+3}$  the second branch is faint, and  $R_{4+5}$  is very prominent.

- V.—The MEDIA (*M*) is unbranched in Chironomids, but in some flies has as many as four branches. In Chironomids it appears to consist of two parts, a thick basal portion and a finer terminal portion. This does not affect the nomenclature.
- VII.—The CUBITUS (*Cu*) forks in Chironomids into  $Cu_1$  and  $Cu_2$ . The position of the base of this fork relative to the cross vein is an important point in describing a wing.
- VIII.—The ANAL, which is very faint or absent among Chironomids, but sometimes has three distinct branches in other families (First Anal, Second Anal, and Third Anal). The last anal vein used to be named the AXILLARY, and the name is still occasionally used.

The writers on Chironomids whose nomenclature it is most necessary to understand are Haliday and Walker (1851), Wingate (1906), and Goetghebuer (1921). Kieffer used the same system as Goetghebuer.

The following table shews the relation of their symbols and names to those of Comstock so far as is necessary to understand the wings of nematoceros flies.

	COMSTOCK.		HAL. & WALK.	GOET.		WIN.
I.	Costa	<i>C</i>	Costa	Costa		Costa
II.	Sub-Costa	<i>Sc</i>	Mediastinal	Auxiliary	<i>A</i>	1
III. <sub>1</sub>	Radius	$R_1$	Sub-Costal	Sub-Costa	<i>Sc</i>	2
III. <sub>2+3</sub>	Radius	$R_{2+3}$	Radial	Radius	<i>R</i>	2a
III. <sub>4+5</sub>	Radius	$R_{4+5}$	Cubital	Cubitus	<i>Cu</i>	3
V.	Media	<i>M</i>	Sub-Apical	Discordal	<i>D</i>	4
VII. <sub>1</sub>	Cubitus	$Cu_1$	Sub-Anal	Postical	$P_1$	5a
VII. <sub>2</sub>	Cubitus	$Cu_2$	Sub-Anal	Postical	$P_2$	5b
VIII.	First Anal	<i>I. An</i>	Anal	Anal	<i>An</i>	6

### TANYPINE WING (Fig. 7).

In the Tanypinæ,  $R_1$  has a branch near the tip joining it to  $R_{2+3}$ . This may be regarded as  $R_2$  and, if so, the next must be  $R_3$ . Among the Corynoneurariæ the branches of *R* are all combined to form a 'CLAVUS.'

## CROSS VEINS.

The cross veins found on nematocerous wings are:—

The HUMERAL (*h*), from *Sc* to *C* near base of wing.

The RADIO-MEDIAL (*r-m*), from *R* to *M*, an exceedingly important vein much used by Wingate.

The MEDIAL (*m*), from  $M_2$  to  $M_3$ .

The MEDIO-CUBITAL (*m-Cu*) from *M* to *Cu*.

Of these *r-m* is present in all Chironomids, and sometimes named  $T_1$  and *m-cu* is present in the Diamesariæ and Tanypinæ and known as  $T_2$ .

## WING CELLS.

Comstock's system of naming the cells, or areolets between the veins, is to name each cell after the vein which forms its front margin, and, in cases where there is a cross vein, to distinguish the parts of the divided cell as first *R*, second *R*, etc., beginning from the base of the wing.

The cells fall into two groups. First:—BASAL CELLS bounded by principal veins, and second DISTAL CELLS bounded by branches of forked veins.

It is advisable in every case to record the length and width of the wing of every fly described. This is a more reliable measurement than the body length.

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**Lesteva luctuosa Fauv. in Westmorland.**—Some time ago I was much struck by the similarity between specimens of *Lesteva luctuosa* Fauv., taken by the late J. W. Carter in West Yorkshire (*The Naturalist*, 1915, p. 104), and three examples of a *Lesteva* in my collection. These last were taken on May 29, 1924, in moss on half-submerged stones in a mountain stream on Murton Fell, near Appleby. Prof. Sir T. Hudson Beare has recently very kindly examined these insects, and, carefully comparing the characters with Fauvel's description, pronounced them undoubted *L. luctuosa*. It is probable that the species may be found in similar situations in other parts of the north of England; and, indeed, Mr. F. H. Day confirms this by informing me that he has, in his collection, four examples taken in waterfall moss on Helvellyn in August, 1910, and one on Skiddaw in May, 1911. It will thus be seen that *luctuosa* Fauv. appears to affect high districts, as compared with the closely-allied *pubescens* Mannh.—M. L. THOMPSON, Middlesbrough.

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Messrs. Merryweather & Sons, Ltd., Greenwich, London, inform us that they will be pleased to send their illustrated catalogue of Watering Hose and Appliances for gardens on application.

The Hull Corporation has agreed to purchase some mosquitoes infected with malaria, in order that they may 'bite' patients suffering from general paralysis, give them malaria, and do them good.

### In Memoriam.

WILLIAM HENRY PARKIN.

YORKSHIRE ornithologists, and particularly those in the neighbourhood of Bradford, have suffered a severe loss by the death of W. H. Parkin, known by his more intimate friends as Harry Parkin, which occurred at his home, with painful suddenness, on April 15th, at the age of 67. He will be chiefly remembered as a simple lover of our Yorkshire birds, which he watched and listened to with the greatest interest



and love, and with the most minute detailed observations of their habits, form, variation in song and plumage, etc. Rarities at a distance had only a passing interest for him. It was as a leader in field excursions, and as a lecturer where W. H. Parkin excelled, and where his services were in great request. He had the power of conveying his enthusiasm to his listeners in the habits and doings of even the most common birds, and he enjoyed a fund of ready humour, which was often told against himself. He did not publish much, but he wrote a few papers for the now defunct *Bradford Scientific Journal*, and contributed stray notes to *The Naturalist* and to a few weekly newspapers, and the late *Zoologist*. He was not a collector, and was very strong in his views regarding the protection of bird life. I cannot do my friend more justice

than to quote from a letter which he wrote to me on March 18th, exactly twenty-eight days before his death: 'I have had a bad time off and on since June. Still I can report progress, and to-day feel *very fit*; but, alas! it is one of those complaints that may develop in any hour to be as bad as ever. The only way is to go very steady—no hurry, no hill climbing, no excitement. So you can understand what that means to me, particularly with the season coming on, when one feels inclined to be up and at it, in the fields and on the hills. However, when the warmer weather comes I hope to do a little "observing," with all respect to Dr. — etc., and I hope to risk it in a gentle way. I miss the meetings at Bradford, and also at Leeds.\* One of the greatest pleasures I had was the Leeds meetings, and I think I only missed ONE, and that the last.'

Although a York man, W. H. Parkin had lived the greater part of his life in the Bradford district. He was a member of a family of great pigeon fanciers, who specialised in the Turbit breed. In his time W. H. Parkin had bred, had exhibited, and had judged, Turbits at the best pigeon shows in the country. He had been a member of the Yorkshire Naturalists' Union for twenty years, and longer than that a member and a regular attender of the Bradford Natural History and Microscopical Society, and was its President in 1905. He was also a member of the Bradford Scientific Association. Among the large number of friends at his funeral were many members of the Yorkshire Naturalists' Union and of the two Bradford societies; and his coffin was carried to the grave by eight members of the Bradford Natural History and Microscopical Society. During the short service at the grave-side a Mistle Thrush sang continuously in a tree close by, and as we left, it was still singing over his body, almost as if by Divine command.

He leaves a widow and a grown-up son and daughter.  
—H.B.B.

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#### WILLIAM PEARSON.

WE regret to have to report the death of a good old Scarborough naturalist—William Pearson—who passed away on Easter Monday in his seventy-ninth year. He had for many years been a member of the Scarborough Field Naturalists' Society, and up to three years ago he was recorder for Coleoptera, being associated in this in recent years with Messrs. E. C. Horrell and G. B. Walsh.

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\* The bi-annual meetings of the section for Vertebrate Zoology of the Yorkshire Naturalists' Union.

Pearson was a joiner and cabinet maker of the old school of highly skilled workers, and greatly respected in his day for his craftsmanship, and for his kindly disposition and simple integrity—qualities which endeared him also to local naturalists. He was one of the type of genuine nature lovers, without ambitious aims or great scientific attainments, who formed the germ of so many naturalists' societies; and still form, if not the backbone, at least the soul of them. He was keenly interested in all living things, and especially in insect life. *Mutilla europæa*, the so-called 'solitary ant,' and the Elephant Hawk Moth, were amongst his best finds, and 'records' for the district.

The loss of his wife several years ago was a great blow, for he had no children to comfort him. His straitened circumstances, following his compulsory retirement, were greatly relieved by the award of an annuity from the Murdock Trust: while the good comradeship of local naturalists soothed his declining years.—D. W. B.

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*The Avicultural Magazine* for June contains an excellently coloured plate of the Derbyan Parrakeet.

Prof. J. H. Priestley refers to the Natural Healing of Wounds in Trees, and W. E. H. Hodson gives Notes on the Stem Eelworm, in *The Journal of the Ministry of Agriculture* for June.

Mrs. Dorothy Una Ratcliffe edits *The Microcosm*, which is sold on behalf of north country charities, and is issued from the City Chambers, Leeds. It is issued quarterly at half a crown, and from the lavish way in which it is illustrated, both by coloured plates and photographs, it is difficult to believe that anything but serious loss can result from the issue of so artistic a Journal. Notwithstanding this, however, it is clear that various northern charities have considerably benefited from the sales of the publication. The Editor is keenly interested in natural history, principally birds, and that subject takes up a large proportion of the pages. To assist the work of our own Journal, the Editor has kindly given us a free advertisement on the cover of *The Microcosm*, and in other ways is forwarding the work of the preservation of the fauna and flora of our county and is encouraging scientific research.

*The Journal of the Marine Biological Association* (Vol. XIV., No. 1, 238 pp., 7/- net) is an index to the activities at that well-known institution, which, however, are not confined to its journal, as is obvious by referring to the lengthy list of abstracts of memoirs recording work done at the Plymouth Laboratory, the original memoirs having appeared elsewhere. Among the contents of the present publication are 'The Euphausiidae in the Neighbourhood of Plymouth,' by Marie V. Lebour; 'Marine Ciliates in the Laboratory at Plymouth,' by W. De Morgan; 'Preservation of Fishing Nets by means of Copper Soaps,' by W. R. G. Atkins; 'Seasonal Changes in the Silica Content of Natural Waters in Relation to the Phytoplankton,' by W. R. G. Atkins; 'The Vertical Distribution of Marine Macroplankton,' by F. S. Russell; 'Experiments on the Early Developmental Stages of Oysters,' by I. Amemiya; 'On Lunar Periodicity in Spawning of normally grown Falmouth Oysters,' by J. H. Orton; and 'Modification by Habitat in the Portuguese Oyster,' by J. H. Orton and P. R. Awati.

## YORKSHIRE NATURALISTS AT ASKERN.

PERHAPS because of the many poetic and sentimental allusions to the delights of May-day with which we are familiar, we looked forward to a Yorkshire Naturalists' Union Excursion on that day with visions of sunny skies, a wealth of spring blooms and the charm of hours of migrant bird-song. The excursion to Askern on May 1st was conducted during a period of continuous rainfall, and the sun was not even momentarily seen. Representatives of most of the sections were present, but reports from each have not been forthcoming for obvious reasons. The President attended, but it was observed that his geological kit was not requisitioned; the principal ornithological official was discovered at 2 p.m. sheltered within the tiny lych-gate of the churchyard at Moss eating a lunch for which he had had no appetite at the proper time, and although his binoculars were once adjusted, it was not with that alacrity which marks his usual enthusiasm when making an observation. A small contingent of naturalists from Doncaster was met at 3 p.m. making for Shirley Pool, and it was pardonable to conclude at first sight that they had already 'been in.'

A General Meeting was held at the Market Café at Askern after tea, when the President, Mr. E. Hawkesworth, occupied the chair. From the chair reference was made to the losses recently sustained by the Union through the death of two of its members, Leonard Gaunt and W. H. Parkin. Sympathy with the families of the deceased which had already been offered by the Hon Secretaries was confirmed. Reports were submitted by W. A. Sledge, W. H. Burrell, Chris. A. Cheetham and F. A. Mason. A vote of thanks was unanimously accorded to the Local Secretary (Chris. A. Cheetham), and to the Rev. M. Yate Allen, M.A., who had given much valuable assistance in the compilation of the circular, and as a leader of the party during the excursion. Thanks were also accorded to the local landowners who had readily given access to their estates. Seven new members were elected.

MOLLUSCA :—Mr. T. W. Saunders has forwarded the following report. From Shirley Pool twenty species of freshwater mollusca were obtained.

<i>Limnæa peregra.</i>	<i>Segmentina nitida.</i>
<i>L. peregra</i> var. <i>ovata.</i>	<i>Physa fontinalis.</i>
<i>L. truncatula.</i>	<i>Succinea putris.</i>
<i>L. palustris.</i>	<i>Sphærium corneum.</i>
<i>L. stagnalis.</i>	<i>Bythinia tentaculata.</i>
<i>Planorbis carinatus.</i>	<i>Valvata piscinalis.</i>
<i>P. umbilicatus.</i>	<i>V. cristata.</i>
<i>P. spirorbis.</i>	<i>Pisidium subtruncatum.</i>
<i>P. vortex.</i>	<i>P. sp.</i>
<i>P. contortus.</i>	<i>Anodonta cygnea.</i>

The woods bordering the pool yielded the following: *Helix nemoralis*, *H. hispida* and *Vitrea allaria*; whilst the slugs seen were *Arion ater*, *A. hortensis* and *Agriolimax agrestis*.

From sixty mole hills, spread over an area of about 100 square yards in the vicinity of Shirley Pool, samples of soil (about 10 lb.) were collected and examined for Holocene fossils, with the following results. The figures in brackets indicate the proportion in which the various species occurred.

## FRESHWATER MOLLUSCA.

<i>Planorbis corneus</i> (1).	<i>Segmentina nitida</i> (1).
<i>P. umbilicatus</i> (abundant).	<i>Aplecta hypnorum</i> (1).
var. (several).	<i>Physa acuta</i> (1).
<i>P. carinatus</i> (6).	<i>Bythinia tentaculata</i> (abundant).
<i>P. spirorbis</i> (abundant).	<i>Bythinia leachii</i> (1).
<i>P. vortex</i> (10).	<i>Valvata piscinalis</i> (9).
<i>P. albus</i> (2).	<i>V. cristata</i> (abundant).
<i>P. crista</i> (abundant).	<i>Limnæa peregra</i> (abundant).
<i>P. contortus</i> (5).	<i>L. truncatula</i> (12).

<i>Limnæa palustris</i> (abundant).	<i>Pisidium amnicum</i> (1 valve).
<i>Succinea elegans</i> (abundant).	<i>P. subtruncatum</i> (odd valves).
<i>Sphærium corneum</i> (several odd valves).	sp. (many odd valves).
	<i>Acroloxus lacustris</i> (1).

## LAND MOLLUSCA.

<i>Helix nemoralis</i> var. <i>libellula</i> (several).	<i>Cochlicopa lubrica</i> (abundant).
type (several).	<i>Hygromia hispida</i> (abundant).
var. <i>rubella</i> (3).	<i>Vallonia excentrica</i> (12).
<i>H. hortensis</i> type (4).	<i>Vertigo antivertigo</i> (30).
<i>Jaminea muscorum</i> (several).	<i>V. pygmæa</i> (4).
<i>Carychium minimum</i> (12).	<i>Vitrea nitidula</i> (3).
	<i>V. cellaria</i> (4).

FLOWERING PLANTS AND FERNS :—W. Arthur Sledge reports as follows: Proceeding by road from Askern to Fenwick the party first saw some quantity of *Lactuca virosa* growing on a hedge bank. The woods between Fenwick and Moss were next worked. Oak was the dominant tree, with some Sycamore, Mountain Ash and Hazel. The ground vegetation was that of a typical oak wood, in the dryer places *Pteridium* and *Holcus mollis* were abundant, and in the wetter parts were *Primula vulgaris*, *Sanicula europæa* and *Oxalis acetosella*. Among the less common plants were *Daphne Laureola*, *Primula variabilis* (*P. vulgaris* × *veris*) and *Corydalis claviculata*. Passing on towards Moss, *Humulus lupulus* was seen in plenty in a hedge where many Hawthorns were already in flower. *Orchis morio* was gathered in an adjoining meadow.

Few flowers were in evidence at Shirley Pool, but the reed swamp bordering the water was examined and the following were distinguished: *Ranunculus Lingua*, *Rumex Hydrolapathum*, *Iris Pseudacorus*, *Phragmitis vulgaris*, *Cladium Mariscus* and *Nephrodium Thelypteris*. The sedges were in too young a condition for determination. *Ophioglossum vulgatum* was plentiful in a wet field near the pool.

BRYOLOGY :—W. H. Burrell, F.L.S., writes: An extension of the known distribution of *Orthodontium gracile* var. *heterocarpum* justified the Askern field meeting. Mr. Cheetham was the 'lucky and instructed' finder of this rare moss, at the base of Oak trees near the Plough Inn, Fenwick. It is worth noting how persistently in recent years the plant has been associated with Union meetings in the south-west division of the county: Raikes Dyke, 1922; Midhope Moor, 1923; Ramsden Clough 1924; Coxley Valley, 1925. It has now been traced from the western to the eastern borders of V.C. 63 at altitudes varying from 25 to 1600 feet. Its position in Coxley Valley, on a Willow tree, not associated with heather, was thought to be unusual, but a similar station at Fenwick suggests that it may have been overlooked in woodlands.

*Aulacomnium androgynum* was in great profusion on decaying timber at Shirley Pool, and *Hypnum riparium* c.fr. along roadside ditches. The very few other mosses seen were *Polytrichum formosum*, *Catharina undulata*, *Ceratodon purpureus*, *Dicranella heteromalla*, *Fissidens taxifolius*, *Webera nutans*, *Mnium undulatum*, *M. hornum*, *Brachythecium rutabulum*, *B. velutinum*, *Plagiothecium elegans*, *P. denticulatum*, *Eurhynchium prælongum*, *Amblystegium filicinum*, *Hypnum cupressiforme*, *Lophocolea heterophylla*.

FUNGI (F.A.M.) :—The following Basidiomycetes were found growing on stumps and rotting wood near Shirley Pool :—*Auricularia mesenterica* (Dicks) Fr., on elm; *A. auricula-Judæ* (L.) Schroet., on elder; *Merulius confluens* Schwein., and *M. corium* (Pers.) Fr.

The smut, *Ustilago longissima* Tul., on *Glyceria aquatica* was collected by both Miss Grainger and Miss Hilary; the aecidial stage of *Uromyces Poæ* on *Ranunculus repens* was collected by Miss Grainger.

FRESHWATER BIOLOGY :—H. Whitehead, B.Sc., reports nymphs of a Mayfly, *Leptophlebia marginata* L. were fairly frequent. This species

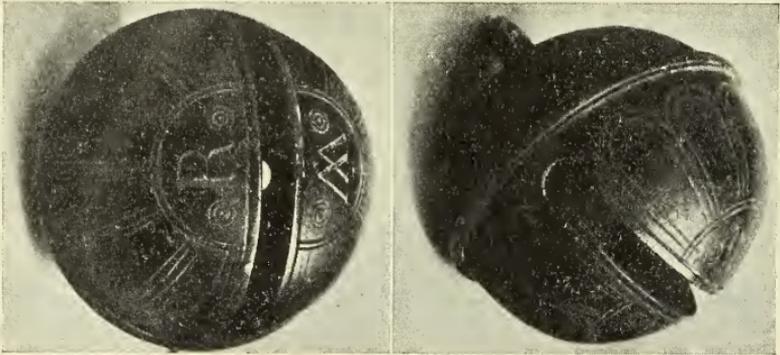
occurs in ponds, lakes and in streams where the current is slow and where the bottom is muddy.

Three nymphs of *Cænis halterata* Fabr., which occur in similar situations, were also taken.

Specimens of the freshwater sponge, *Ephydatia fluviatilis* (L.), with its symbiotic alga, were common on submerged sticks.

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**Sussex Cattle Bell.**—*Country Life* the other day had the following interesting note in reference to an antique Sussex Cattle Bell, and the Editors have kindly enabled us to reproduce it together with the illustration:—‘ This bell, one of a number of equal age and similar appearance, is still used by a Sussex farmer whenever a herd is pastured on unenclosed land. From its appearance, it is undoubtedly of considerable antiquity. The style of decoration suggests sixteenth century



work, and colour is given to this suggestion by the fact that there was, in the time of Queen Mary, a foundry at Lewes that cast bells and other articles in brass and bronze, owned by a family of the name of Woodman; it will be noticed from the accompanying photographs that the bell bears the letters “R.W.” This business was transferred to Berkshire during the Marian persecution. The bell seems to be made of bronze, and weighs about one and a half pounds. It is rung by a metal ball, free to move anywhere within the hollow interior. When in use round an animal’s neck, the opening in the bell is lowest and the sounding ball naturally rolls along the edges of the opening. Centuries of use have worn these edges to razor-sharp keenness—further proof of the great age of the bell. Wear is not so apparent on the fixed ring through which the supporting strap passes. Year by year the stock of these old bells decreases, for those lost on the Downs are seldom recovered.’ With the exception that our bell is considerably worn at the loop, through having been swinging from the animal’s neck—in fact, the loop is almost cut right through—the above description and illustration would equally apply to our example.—T. SHEPPARD.

## NEWS FROM THE MAGAZINES.

'Botanic Science: Its Phases, Superstitions, etc.,' by H. R. G. Skelton, occurs in *The Medical Herbalist* for June.

*The Journal of the Ministry of Agriculture* for May contains an article on the 'Downy Mildew' or 'Spike Disease' of the Hop, by E. S. Salmon and W. M. Ware.

*As You Like It*, the social magazine for Messrs. Joseph Rank, Ltd., for May, contains an exciting account of a Sporting Trip to Iceland and a Whale Drive at the Faroes.

In the first number of *The North Western Naturalist*, after giving a number of Obituary Notices, we observe that the Editors 'Hope to give further notices in our next issue!' Callous!

Mr. C. Davies Sherborn gives particulars of the actual dates of publication of some of the old British Museum Catalogues dealing with insects, in *The Annals and Magazine of Natural History*.

A suggestive note by Herbert Maxwell on the distribution of freshwater fish in the rivers of eastern England and in the Rhine, and its geological significance, occurs in *Nature*, No. 2951.

'"First dates" of the occurrence of lepidoptera in the Lake District,' by Dr. R. C. Lowther, and 'British Paraneuroptera in 1925,' by Mr. W. J. Lucas, appear in *The Entomological Magazine* for June.

J. St. C. Deville refers to the Forms of the various species of *Carabus* in the British Isles, and J. E. Collins writes on 'The *Empididae* (Diptera), with additions and corrections to the British List,' in *The Entomologist's Monthly Magazine* for June.

In *Nature*, No. 2946, Kathleen E. Carpenter, H. Whitehead and E. Percival record *Planaria albissima* Vejd., near Aberystwyth, Leeds, and Pately Bridge respectively. Apparently this planarian had not previously been recorded in Britain.

*The Irish Naturalists' Journal* for June contains a well illustrated account of 'Our Social Wasps and How to know them,' by A. W. Stelfox, and an illustrated 'Observation on the Woodcock carrying Young,' by J. A. S. Stendall, with many other interesting notes.

'Notes on Alberta Waders in the British List,' by W. Rowan; 'Some New British Birds,' by H. F. Witherby; 'Breeding of the Dotterel in the Pennines in 1925,' by E. Blezard; and 'The Display of the Pied Wagtail,' by H. Boase, occur in *British Birds* for June.

Among the additions to the Museum at Taunton, we notice: "'Cast infilling of one of the chambers of an ammonite.' Dr. F. A. Bather, F.R.S., says, 'It is not flint or chalk, but is probably of Jurassic age.' Mr. Reid Moir in *Man*, February, 1919, art. No. 10, regarded these specimens as primitive man's carving to represent a quadruped; but this notion was exploded by Sir H. H. Howorth in *Man*, May, 1919, art. No. 35."

H. R. G. Skelton writes on 'Botanic Science—Its Phases, Superstitions, etc'; J. Skelton on 'Tormina or Gripes'; T. Ramsden on 'Common Plants and their Uses'; and J. Watmore on 'Our Herbal Heroes' (one of the greatest of whom was called Coffin) in *The Medical Herbalist* for May. Arrangements have been made for plants to be identified at a charge of one shilling.

The recently formed British Institute of Philosophical Studies has brought out Part I. of the *Journal of Philosophical Studies* (142 pp., 3/6, Macmillan & Co.), under the editorship of Sydney E. Hooper, supported by a strong bank of philosophers. The articles in the number issued are 'Art and Science,' by Prof. S. Alexander; 'The Metaphysical Systems of F. H. Bradley and James Ward,' by Prof. G. Dawes Hicks; 'Emotion and Instinct,' by M. Ginsberg; 'Different Kinds of Evolution,' by Prof. J. A. Thomson; 'The Present Outlook in Social Philosophy,' by Prof. J. S. Mackenzie; and 'The Purpose of Philosophy,' by Prof. F. B. Jevons. In addition there are Abstracts of Lectures, Philosophical Survey, Periodicals, Correspondence, etc.

## NORTHERN NEWS.

Mr. H. Kirke Swann, who was a keen student of Ornithological Bibliography, died on April 14th.

We have received the Haworth Ramblers' Circular for the Excursion to Walshaw Dene and Heptonstall, which is very informative, as usual.

The Zoological Photographic Club is petitioning the Prime Minister with the object of obtaining Mr. Richard Kearton's name in the next honours' list.

Professor Alexander Petrunkevitch favours us with his notes on Spiders from the Virgin Islands, reprinted from *The Transactions of the Connecticut Academy of Arts and Sciences*.

Dr. R. Daydon Jackson has retired from the post of General Secretary to the Linnean Society, and has been appointed to the special post of Curator to the Linnean Collections.

Dr. F. A. Bather, President of the Geological Society of London, has unveiled a tablet in memory of William Smith, at the house where Smith resided during his sojourn in Bath.

An interesting and well illustrated article on Roman Roads of Berkshire, and another on the Eccentric Characters of that County, occur in *The Berks., Bucks. and Oxon. Archæological Journal*, Vol. XXIX., No. 2.

A sacred white elephant has taken up his quarters at the London Zoo. His skin is white, his hair is straw coloured, and he has pink eyes. The sight of just such animals as this has driven many a man to sign the pledge; so says the *Yorkshire Weekly Post*.

'Report on the Respiratory Exchange in Freshwater Fish, with Suggestions as to Further Investigations,' by J. A. Gardner ('Fishery Investigations,' Series I., Vol. III., No. 1, 13 pp., 2/-) and 'The Herring in Relation to its Animate Environment, Part II.,' by A. C. Hardy (Series II., Vol. VIII., No. 7, 13 pp., 1/6) are the titles of two valuable memoirs issued by the Ministry of Agriculture and Fisheries.

When some time ago the Hull Corporation decided to have the reservoir near the River Hull at Stoneferry filled with sand so that it could be used for building sites, the Hull Angling Preservation Society applied to the Corporation for permission to remove the fish to other waters before the pumping operations began. This was granted, and the number of fish taken from the reservoir was about 13,000, 10,000 of which were transferred to the Market Weighton canal, and 3000 to the River Hull at Hull Bridge.

The British Museum (Natural History) has issued a *Guide to the Collection of Meteorites*, with an alphabetical list of those represented (43 pp., 6d.). The list alone is astonishingly large. Among the collection is the Wold Cottage Meteorite which fell in Yorkshire in 1795, and we believe there is a monument erected recording the event. The guide has been written to replace the late Sir Lazarus Fletcher's 'Introduction to the Study of Meteorites,' the last edition of which was published in 1914. Additional matter concerning the mineral composition, method of classification, and mutual relations of meteorites, drawn from more recent work on the subject, has been incorporated.

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**Why we Behave like Human Beings**, by G. A. Dorsey. London: Harper & Brothers, xv.+512 pp., 12/6 net. This volume is written by a former professor at the Chicago University in a very popular style, and as it has already had its 'tenth printing' it will be understood that it has had a tremendous sale. While dealing with various discoveries in modern science, the author evidently believes in the maxim 'Man know thyself,' and gives details of the various organs and functions of the human body and points the way to health.



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# THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL  
PRINCIPALLY 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

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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## NOTES AND COMMENTS.

## A WARNING.

We take the following from the press : ‘ Mr. Edgar Percival Chance, author of “ The Cuckoo’s Secret,” was fined £13 10s. and £9 2s. costs at East Harling, Norfolk, yesterday, for aiding and abetting Albert Wyatt, a farm steward, to take 27 wild birds’ eggs, namely, Crossbills. Wyatt was fined £6 19s. Dr. Sydney Long, Secretary of the Norfolk Wild Birds’ Protection Society, stated that while looking for a colony of nesting Crossbills on the Euston Road on March 7th, Wyatt offered him a clutch of Crossbill eggs, which witness bought for 15s. Wyatt added that he was sending five clutches to a customer in London, who paid him well. The police were informed, and it was found that Wyatt sent the eggs by train in a parcel addressed to Mr. Chance. The parcel was collected by Horace Dean, a clerk, engaged by Chance, but a detective intervening took the parcel from him. These birds, said witness, had crossed bills like Parrots. Asked how he knew these were Crossbill eggs, Dr. Long said he had seen them at museums, and knew the look, shape and markings. You know that Mr. E. Kay Robinson says that the egg of the Crossbill is indistinguishable from the egg of the Greenfinch?—He may say so. I do not attach much importance to such a statement. The defence was that the eggs were those of the Greenfinch, which was not a protected bird.’

## MAKING EOLITHS.

We learn from *Nature*, No. 2947, page 602, that ‘ A sequel to the now famous study of the “ eoliths ” produced in the course of the manufacture of cement at Mantes, which was made by Prof. M. Boule in 1905, appears in Nos. 1-2 of Vol. XXXVI. of *L’Anthropologie*. In 1924 Mr. Etienne Patte, at the suggestion of Prof. Boule, examined flints similarly produced by a cement factory at Beaumont-sur-Oise, and found them to be identical in form with the implements found in the Pliocene of East Anglia, for which a human origin is claimed. The method pursued in selection was identical with that followed by those who accepted the Pliocene specimens as artefacts ; that is, a process of repeated classification, selection, and rejection which ends in the assembly of a relatively small number bearing what are said to be indubitable traces of human purposive working. In this case the causes are mechanical ; but the chipping is identical, and the result a collection of characteristic types, rostro-carinates, etc. More remarkable still, a crushing machine, which consisted of two “ jaws ” shod with iron, the lower being fixed, produced flakes, some of which showed

an apparent secondary chipping, and might have been taken for scrapers of an Upper Palæolithic or even Neolithic culture.'

#### DARLINGTON FIELD NATURALISTS.

Excellent reports of the year's work were presented at the annual meeting of the Darlington Field Naturalists' Club, held recently. Mr. J. E. Nowers, the Hon. Secretary, stated that the renewed activity mentioned in the previous year's report had been maintained, and the archæological, botanical, ornithological, and footpaths sections had done a lot of good and useful work. Two members had been lost by the deaths during the year of Walter Hodgson, a former President, and Robert Byers. The club had arranged six excursions, and three were held in conjunction with the Naturalists' Union. The usual evening meetings were held with an average attendance of 32 against 28 the previous year. A new feature of the club had been the keeping of systematic records for the Royal Meteorological Society, the work having been in the hands of Mr. J. B. Nicholson. The club's membership was now 171 against 158 last year. The financial report showed a balance in hand of £32 18s. 4d. Mr. J. Broadhead, the Librarian, reported that the number of books in the library now totalled 353.

#### SWINGING THE LEAD.

We see from a Special Correspondent's contribution to *The Yorkshire Post* dealing with the Rievaulx Abbey Restorations that: 'There was real dramatic humour in the finding amid the débris four of the great pigs of lead bearing Henry VIII.'s seal—plunder of the abbey roofs which was never to reach his treasury. One of these ingots is still in the little museum at the abbey which the Office of Works have established; the other three, it is *pleasant* to think, were turned to use in the re-leading of the Five Sisters and other windows of York Minster.' Personally we could find a much more appropriate word than 'pleasant.' There are many museums which would gladly have purchased, or have given more than an equivalent in the weight of lead, for one of these ingots, and it seems absurd to have allowed these valuable relics to be put into the melting pot. Henry VIII.'s still seem to exist among us.

#### A NEW JOURNAL.

Flatteringly similar to '*The Naturalist*' in many of its features, *The North Western Naturalist* has made its appearance in a substantial pamphlet of 60 pages, which is to be issued quarterly. We do not quite agree with the first sentence in the Journal, namely: 'It is rather surprising that in an area such as our own there has been no satisfactory medium for effectively linking up and recording the activities of insti-

tutions, societies, and workers in natural history, microscopy, and archæology.' As a matter of fact, a number of quite good journals exist, or have existed, and certainly *The Lancashire and Cheshire Naturalist*, which ran for so many years, seemed to cover much the same ground as the new publication. We observe that, copying the example of *The Lancashire and Cheshire Naturalist*, certain counties, such as Derbyshire and the Isle of Man, which have been served by *The Naturalist* for more years than we care to remember, are included in the area for the new Journal. North Wales seems more appropriate than some of the other counties, the name of one of which is so remote as to have been misspelt! Yorkshire, fortunately, does not, at present, seem to be included in the activities of *The North Western Naturalist* so far as its publishing sphere is concerned, but Mr. M. H. Stiles has an interesting note on *Cocconeis distans* in Yorkshire, and there are other references to our greatest county which suggest that its editors are more grasping than are those of *The Naturalist* itself! The contents of the first part include 'Green Alga Parasitic in a Water Snail,' by A. E. Boycott; 'Bird Notes from North Wales,' by A. Hamilton; 'The Wells of Bromborough and District,' by W. A. Lee; 'Notes on Manx Antiquarian Ornithology,' by P. G. Ralfe; and 'The Crane Flies of Carnarvonshire,' by H. F. Barnes, all of which seem appropriate. We trust the Journal will receive the financial support its first number certainly deserves.

#### SYNONYMY OF THE BRITISH NON-MARINE MOLLUSCA.

Messrs. Kennard and Woodward have rendered a great service to the history of this subject by tabulating a practically complete synonymy of the Land and Freshwater Shells of the British Islands. Anyone can now see at a glance the reason for and the reason why a certain nomenclature is adopted, and whether they agree with it or not, the facts are now on record. The authors have spent years on the work, and the volume of 447 pages is a monument of painstaking labour. For *Petasina fulva* alone there are 62 quotations, and the whole bibliographical history of the species is unfolded to the view. The book is published by the Trustees of the British Museum, and is a great contribution to British Zoology. It concludes with a complete Bibliography of 52 pages, which is itself of great value, and a full index by Mr. Vickery (31 pages). The price (not stated), is, we believe, twenty shillings.

DR. A. C. SEWARD, F.R.S.

We are glad to quote the following in reference to a past-President of the Yorkshire Naturalists' Union, which appeared in *The Observer* for the 6th June: every word of which we

can endorse :—‘ The announcement that the Rev. G. A. Weekes, Master of Sidney-Sussex College, is to be the next Vice-Chancellor is a reminder that Professor Seward’s term of office ends on October 1st next. In him the University was fortunate indeed, and there will be widespread regret at his passing, for few Vice-Chancellors can have performed their arduous and delicate task with greater success. Diligence and hospitality, a happy nature and a tactful tongue, these are the qualities which have distinguished the kindly Master of Downing ; they have earned him the respect and gratitude of the whole University.’

THE GALILEE SKULL.



The accompanying illustration is of the Galilee Skull, discovered by Mr. Turville Petre, in 1924, in a cave floor near the Lake of Galilee. It formed the subject of an interesting discussion at the Southampton Meeting of the British Association in 1925, and is remarkable as being the first specimen of Neanderthal Man to be found outside Europe. Messrs. R. F. Damon & Co. are issuing reproductions of this skull, one of which has just been received at the Municipal Museum at Hull, and is a remarkable example of the beautiful way in which this firm carries out this work.

## THE MUSEUMS ASSOCIATION AT BOURNEMOUTH

THE Annual Conference of the Museums Association was held at Bournemouth in July. In proposing a vote of thanks to Mr. Eric Maclagan, C.B.E., at the final session, Mr. T. Sheppard stated that he had attended these Conferences now for a quarter of a century, and certainly, in his opinion, those interested in museums had received more practical assistance this year than at any previous Conference. It was doubtless due to the fact that the President was Mr. J. Bailey, who was formerly connected with the Victoria and Albert Museum. Mr. Bailey induced his former colleagues, the heads of the various London Museums, to attend the Conference, and in this way those in the provinces were considerably assisted in their work, and in the future will be helped even to a much greater extent. In his Presidential Address at Hull, Mr. Sheppard appealed for more assistance from the Government Museums and Galleries. This subject has since been followed up by the Council of the Museums Association, and culminated in Bournemouth, when the heads of the different Government departments assured the museum representatives present that they were prepared considerably to assist in different ways.

The theme of Mr. Bailey's address was the desirability of having financial assistance to the smaller museums from the Carnegie Trust, or similar sources. Mr. Maclagan described the way in which his department had assisted, and were assisting, provincial museums, by the loan and occasional gift of suitable specimens; but in view of the abnormally small amount of the grant made by the Government for this purpose, his activities were naturally somewhat limited.

A particularly inspiring address by Sir Robert Witt, on the Public and Museums, dealt with the question from the point of view of 'the man in the street.' Sir Robert, as Chairman of the Art Collections Fund, and in other ways, has considerably assisted national and other collections by gathering monies together for the purchase of objects which should be kept in this country. He stated he realised that at last the various Government Departments were recognising museums as part of the educational scheme in the country, and that while obviously their first duty was to secure and exhibit valuable scientific and art objects, secondly, it was necessary that these should be exhibited and described in such a way that the public might get the greatest benefit. He advocated that museums should advertise their work much more than they do at present, that they should issue periodical publications containing descriptions of their important additions, that well-illustrated catalogues of the collections should be prepared, and that

postcards illustrating the more important objects should be sold. He also urged that lectures to school children and to the public should be given, and concluded by stating that where possible advantage should be taken of the advertising medium now obtained by means of broadcasting through the B.B.C.

Sir Robert deplored the fact that although officials from museums were well represented at the Conference, the number of members of the Committees was by no means what it should be. He considered at the very least that each Committee should be represented by two members, as he felt sure that a much better idea of the educational value of museums would be obtained if more members attended these Annual Conferences. He was sorry to find that in some cases not a single representative, other than the Director, was present, and he sincerely trusted that this was not due to any apathy on the part of the Corporations concerned.

The President flatteringly referred to Hull's activities in all the directions mentioned above, and stated that he had noticed that the press was particularly appreciative, had considerably assisted Mr. Sheppard in his work, and doubtless it had much influenced the fact that Hull now possessed five museums, two of which, that relating to Fishing and Shipping, and the Commercial Museum, were unique, and indicated that the business man was able to benefit from one aspect of museum work.

Many other subjects of general interest were discussed, including The Dating of English Woodwork, Biology and our Public Museums, Museum Organisation, The True Test of a Museum's Value, Art Education in relation to Museums; as well as a number of shorter papers dealing with technical aspects of museum work.

An American delegate, Mr. L. E. Rowe, gave practical accounts of recent improvements in American museum technique. Various well-known firms exhibited their most recent improvements in the way of museum cases, glass jars, and other equipment.

Visits were paid to the Russel-Cotes Museum at Bournemouth, to the wonderful museum of Prehistoric and other collections at Farnham, made by the late General Pitt Rivers, to the Norman Minster at Wimbourne (where there is a chained library and a wonderful astronomical clock, dated 1325, which is still in working order). A visit was also paid to the New Forest, Romsey Abbey, Beaulieu Abbey, the Rufus Stone, and other places.

—: o :—

The press records a seal at Skipsea, E. Yorks., on July 9th. It appeared to be 'rounding up' fish.

## THE RATE OF GROWTH OF LIMNÆA PEREGRA.

F. M. TURNER, M.D., B.SC.

SEMPER's experiments on the growth of *L. stagnalis* have attracted wide attention, and been repeated by many observers. He showed, in 1874 (<sup>2</sup>), that the rate of growth of a snail was markedly influenced by the volume of water in which it was confined. For growth at the maximum rate he found that a jar holding from 2000 to 4000 cc. was necessary. In smaller jars the rate of growth was approximately proportional to the volume of water, *i.e.*, to the size of the jar.

If several snails are kept in one jar the rate of growth is equal to that when each snail is kept in one jar containing the equivalent quantity of water. That is, if  $n$  snails be placed in a jar or volume  $V$ , the rate of growth is equal to that of snails, one in each jar, if the latter contain a volume  $v = \frac{V}{n}$ .

Hogg (<sup>1</sup>) had in 1854 found that young *L. stagnalis*, kept 'in a small narrow cell,' remained small, and after six months only reached the size usually attained in two to three weeks, while others of the same brood and age, placed in favourable circumstances, grew up in two months and bore young.

Many subsequent workers have repeated these experiments, and all but one have confirmed them. Some used other species of *Limnæa* or *Planorbis*. Others have found similar results with frog tadpoles, *Daphnia*, and echinoderm larvæ.

Many, including Semper himself, think that the effect is general among fresh-water animals, and Semper cites as a parallel phenomenon the fact that the biggest fish are usually found in the larger streams and lakes.

Many hypotheses have been put forward to explain the phenomenon. Semper attributed it to the exhaustion of some unknown chemical; de Varigny (<sup>3</sup>) to want of room for exercise; Legendre (<sup>5</sup>) to accumulation of excreta; Willem (<sup>4</sup>) to CO<sub>2</sub> or lack of oxygen; Colton (<sup>8</sup>) to a large number of factors; and Popovici-Bazosanu (<sup>7</sup>) to lack of food. My own observations tend to show that the latter is the most important factor.

My observations have been partly experiments designed for the purpose, growing snails in jars of various sizes, with varying numbers in each jar, and under different conditions; partly observations taken while breeding snails for a genetic research undertaken by Prof. Boycott on the inheritance of the sinistral form of *L. peregra*.

In four years I have bred five generations and over 39,000 young. Up to date 493 have been reared to maturity and have laid eggs.

The usual method of breeding was to plant out young snails, either singly or in pairs, in large jars holding about 2500 cc. Some were young newly hatched, about 1 mm. long. More often they had been several weeks or months in the nursery and were 3-4 mm. long or larger. In many cases snails hatched one summer were only planted out the following February or March. In each jar some *Elodea* was placed, usually also *Lemna minor* and *L. trisulca* were found and, of course, minute algal forms.

The following are the results:—

1. The majority of snails so planted out grew to adult size and bred. A small mortality occurred, chiefly in very young individuals, usually less than 10 per cent. If larger snails were used, hardly any died. A few grew to full size, but did not lay.

2. Single snails being hermaphrodite lay freely, and usually lay as many eggs as a pair. They do not, however, lay so early in the season, and usually grow somewhat larger before laying.

3. Snails attain sexual maturity before reaching full size. With pairs they often laid when 10 mm. long, but subsequently grew to from 15 to 19 mm. Singles, as a rule, do not lay till 12 to 15 mm. long, but if two singles have reached that size, and are then placed together, they usually pair within a few hours, and lay a few days later.

4. No growth, as a rule, takes place in winter, say from October to March, and in a cold spring in April also, though in some cases I have found slow growth to occur.

From May onwards growth is rapid. In some cases they nearly double their length in four weeks. Thus, sixteen snails of one brood planted as singles had a mean length of 4.3 mm. on April 8th, and 8.6 mm. on May 9th, 1923.

5. In many cases snails laid within two months of being planted out. As most of my snails were not planted out till they were several months old in the nursery, I have few records available as to the minimum time from hatching to breeding; also in few cases has the exact date of hatching been recorded. In most cases only one brood has been hatched per year, but it is quite easy to get two broods a year, if the parents are full grown in autumn and lay early in the spring. The next generation may be planted out in June, and will lay before autumn. During the 1925 season I succeeded in rearing three generations from one pair. The minimum time therefore requisite for one generation is probably about two months.

6. Many circumstances such as temperature, exposure to light, which might conceivably exert a great influence on growth, have not done so, at least so far as I can judge.

Thus, in the season 1922 all my jars were kept indoors, in 1923 and afterwards all were outdoors. In the earlier year about half were on window sills looking north, the remainder on sills looking east and consequently getting much more sunshine. There was very little difference in growth or fertility. Also growth was not affected markedly by the growth of the waterweeds. The amount of growth of *Elodea* and *Lemna* varied extremely in jars, even those put up at the same time and exposed to the same conditions. Great variation also occurred in the amount of algal scum growing on the glass, and in the condition of the water, which sometimes remained clear, sometimes turned green and quite opaque.

7. The size of the snails and their age when taken out of the nursery had no influence on the ultimate size reached nor on their fertility.

In striking contrast to the above facts, are the records of growth when snails were planted as singles or pairs in smaller jars; or if a number were placed in one jar; or if a brood containing many snails were left in the jar in which they were hatched, which jar I call the "nursery."

Taking the latter case first, the young broods usually hatched about June, but were often not counted till late autumn. The number in a brood varied from a few, sometimes one only, up to several hundred, and in one case to over a thousand. In all cases the size of the young snails varies inversely to their number. The parents usually die soon after laying, but sometimes one or both survive to the following year. If one young snail only survives from a brood it will reach nearly adult size; if many, they rarely much exceed 3 mm., as shown by the following table:—

TABLE I.

Brood No.	Snails alive Oct. 1922.	Snails alive Feb. 1923.	Mean length.	Shortest length.	Greatest length.
5017	7	5	7.1 mm.	6 mm.	8 mm.
5013	19	10	4.2 "	2.5 "	7 "
5022	90	53	3.3 "	2 "	5.5 "

If several snails are planted out they begin to grow rapidly, while those left in the nursery remain stationary.

TABLE II.

14 snails planted out Feb. 27th, 1923, measured on May 23rd:—

Mean length, 10 mm.  
 Maximum ,, 13 ,,  
 Minimum ,, 5 ,,

26 snails of same brood remaining in the nursery :—

Mean length, 2.7 mm.

Maximum ,, 3.5 ,,

Minimum ,, 1.8 ,,

I have kept many nurseries over two years, and in one case for  $2\frac{3}{4}$  years. The snails remain stationary so long as the numbers are retained, but usually some die out, and the survivors grow a little in correspondence with the smaller numbers. At any time the survivors, if planted out singly or in pairs, will grow up normally and breed.

TABLE III.

Brood No. 5001, originally containing 200 young,  
born Aug., 1922 :—

Measurements.	Date.				
	Oct. 7, 1923.	Feb. 13, 1924.	May 2, 1924.	July 3, 1924.	Mar. 8, 1925.
Mean ...	3.2	3.9	3.9	4.8	8.1
Maximum ...	7.5	9	9	6	10
Minimum ...	2.5	3	3	3.5	5.5
No. of survivors	32	25	25	15	4

From this brood snails were planted out on the following dates, and subsequently grew up to normal size :—March 2nd, 1923 ; May 2nd, 1924 ; July 3rd, 1924 ; and March 8th, 1925.

From these experiments it is clear that the dwarfing effect of overcrowding is a purely temporary one, a mere retarding of growth. Semper and others have assumed it to be a permanent one, and that it would be possible thus to breed a dwarf race of snails, but this is not so.

I think this is strictly analogous to the dwarfing seen in plants when seedlings grow crowded together.

Planting snails in smaller jars, usually 30 oz. or 11 oz., I have never got them to grow up in one season. In the smaller size jar they usually stop growth at 6 mm., a few only reached 10, and one 12 mm. In one case only have I found eggs in a 30-oz. jar, though many were kept through two seasons.

#### ARTIFICIAL FEEDING.

It is possible to feed *L. peregra* or *L. stagnalis* on lettuce leaves or on watercress. Frequent attention is not necessary, as lettuce leaves will often remain fresh from two to three weeks. The snails usually prefer the portions that go rotten, sometimes refusing to feed on the sound portions.

Using either of these two forms of food, I have bred, during

the last two years, 27 singles and 32 pairs, 59 in all, in small jars of 11, 20 or 30 oz. In 7 jars the snails died young, but in the remainder grew to full size. In 37 jars, eggs were laid. In the first successful case, a single snail in an 11-oz. jar, over 480 eggs were laid. In the others the eggs were in at least the average numbers. In most cases the size attained was larger than those bred in large jars, but without lettuce. Maximum length, 22 mm. ; against 19 mm. Also in several instances snails which had remained one or two years in small jars commenced to grow again when lettuce was added. In several instances a pair was bred to full size and eggs laid in an 11-oz. jar. Colton found the number of eggs laid varied with the size of the jar, rather than with the number of snails. Two snails in one jar did not lay more eggs than a single snail, but one snail in a big jar laid more than one in a small one. On the other hand, with artificial feeding, I find that the number of eggs laid in a small jar may be quite up to or larger than the average.

## SUMMARY.

1. In breeding *L. peregra* in large numbers I have found that large jars of 2000 cc. or more are required for each snail or pair of snails. In jars of 900 cc. or less they would not grow to full size nor lay eggs. But if artificially fed this limitation disappears and breeding has succeeded in jars of 330 cc.

2. Keeping the jars indoors, or outdoors, involving wide variation in light, temperature, etc., also wide variation of the growth of water plants, does not influence the result.

3. *L. peregra* will breed within 2½ months from hatching, probably in less. Three broods can be obtained in one year.

4. The dwarfing effect of overcrowding is temporary only. As soon as the snails are removed to larger jars they grow. Even after one or two years they grow to normal size in a normal time.

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Belated arrival, having missed the other members at the rendezvous, hunts for them in the woods and presently discovers a lady sitting under a tree, reading. 'Have you seen anything like a natural history society anywhere about?' 'No: I've only seen quite ordinary people since I have been here.'

## REVIEWS AND BOOK NOTICES.

**Goldfish Culture for Amateurs**, by A. E. Hodge and A. Derham. London: H. F. & G. Witherby, xi.+103 pp., 5/-. Increased interest having been taken in recent years in the rearing of ornamental fish in aquaria and ponds, the authors have given some practical information in this volume dealing with the feeding and rearing of these animals, and the best methods to be taken in order to keep them healthy.

**Geological Maps: The Determination of Structural Detail**. London: Humphrey Milford, vii.+175 pp., 12/6 net. Still another volume has appeared relating to geological maps, and in this an account is given of the work of the Geological Survey Department, Method of Surveying, signs and symbols to be met with on geological maps, together with descriptions of such items as falting, dip, contours, etc. A wealth of diagram and other illustration helps to make the book understandable.

**Opal: The Gem of the Never Never**, by T. C. Wollaston. London: T. Murby & Co., xi.+164 pp., 10/6 net. The author deals with the various forms of opal to be met with in Australia, methods of excavation and preparation. He calls it Australia's National Gem, and predicts a great future for this beautiful mineral. Certainly increased prices in recent years seem to warrant his assumption that the mineral is to become more popular. In addition to a record of what is known of the gems themselves, the author gives an account of old-time opal hunters and their methods, etc.

**Insect Life and the Management of a Trout Fishery**, by M. E. Mosely. London: G. Routledge & Sons, Ltd., x.+112 pp., 7/6 net. In this compact little volume the author, by the aid of several plates and other illustrations, gives an account of the various insects likely to be of service in connection with the hatching of trout, and the practical description of trout rearing in all its aspects, dealing with food, weeds, netting, pollution, stocking, acclimatization, etc. As the author of the *Dry-Fly Fisherman's Entomology*, he has a practical acquaintance of this difficult part of the subject.

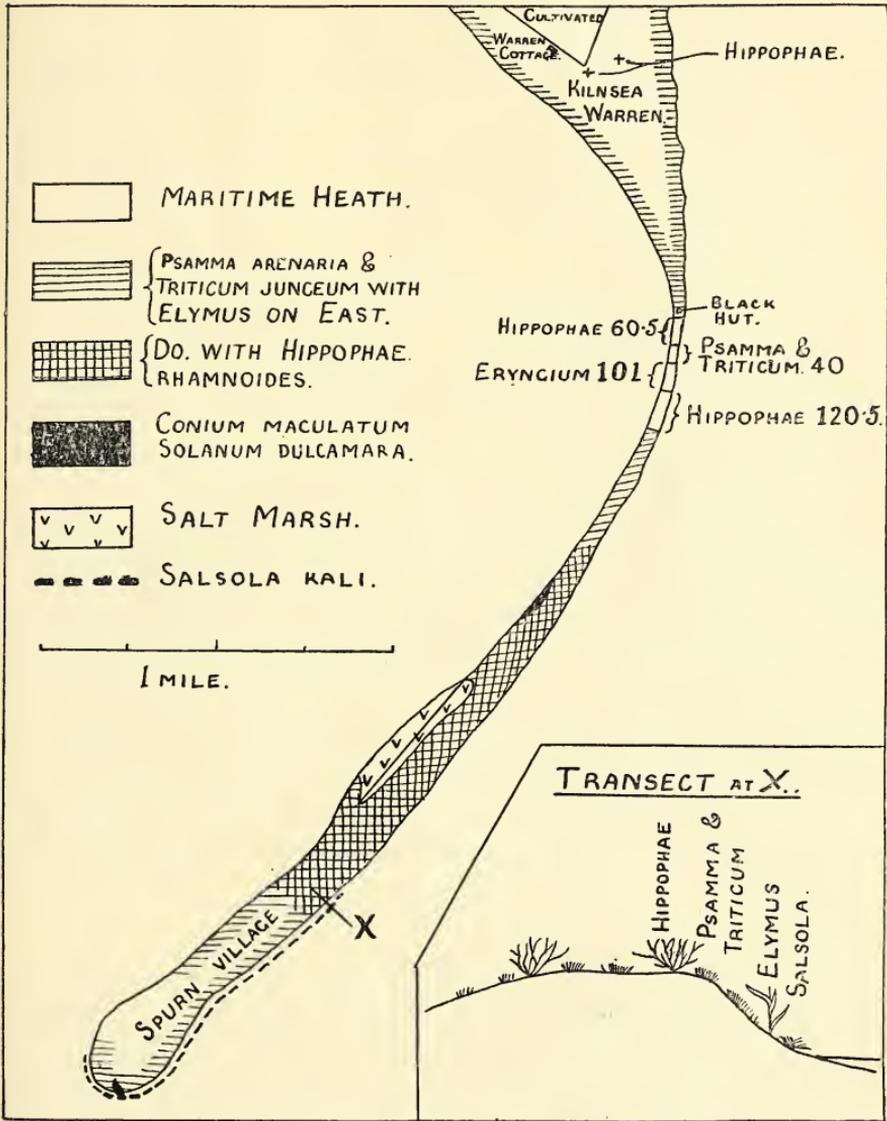
**1825-1925: A Century of Stupendous Progress**, by Joseph McCabe. London: Watt & Co., viii.+168 pp., 5/-. This ever popular author well summarises the extraordinary advances made in scientific progress during the past century, and Messrs. Watt have published it in their familiar well-bound and cheap form. The headings to the chapters are Progress in Wealth; The Life of the Worker; The Ghastly Penalties; Social Life a Century Ago; Morals and Education; Political and Legal Corruptions; Science the Redeemer; The Creation of Wealth; The Uplift of Life and Personality; Science and the Residual Blunders; and Science and the Future.

**The Quantum Theory of the Atom**, by G. Birtwistle. London: The Cambridge University Press, xi.+236 pp., 15/- net. This book opens with an account of the quantum theory from its inception by Planck, which is followed by a full treatment of the dynamical theory evolved by Bohr and his school during the past ten years, to explain the phenomena of line spectra. The theory ranges from the earliest simple conception of the circular orbit of hydrogen to the application to the atom of the theory of perturbations of celestial mechanics. Some chapters are devoted to a general description of optical and X-ray spectra and their significance in the problem of the atomic structure of the elements. The book closes with an account of the new work on the reaction of the atom to radiation fields, which promises to lead to far-reaching developments of the quantum theory. We regret to say that the formulæ and other information given in this volume are beyond us, but we have pleasure in drawing attention to it for the benefit of those of our readers who are interested in mathematical problems.

NOTES ON THE VEGETATION OF SPURN.

JOHN GRAINGER.

BEING fortunate enough to spend the greater part of 1925



at Holmpton, near Withernsea, on the Holderness Coast, the writer found great pleasure in frequent trips to Spurn, and the remarks which follow are the result of observations made during these trips.

For the geology of Spurn the reader must be referred to Sheppard's 'Geological Rambles in East Yorkshire,' 1903,

and to Kendal and Wrooths' 'Geology of Yorkshire,' where explanations and descriptions of this singular shingle spit will be found.

There are several quite well marked associations of plants to be studied, the chief being :—

1. The border of *Elymus arenarius*, *Psamma arenaria* and *Triticum junceum*, with *Salsola Kali* in certain areas.
2. The maritime heath of the wider part of the isthmus known as Kilnsea Warren.
3. The shrub association of the narrow isthmus and head.
4. A very limited salt marsh association.
5. The vegetation of the head, affected by the military occupation.

The first and third of these associations cover the greater part of the peninsula, and together constitute a typical sand dune succession.

#### I. THE BORDER OF ELYMUS, PSAMMA AND TRITICUM.

The pioneer of this succession is Prickly Saltwort (*Salsola Kali* L.), and the distribution of this plant roughly coincides with the regions where the land is encroaching on the sea, viz., at the point, and extending about one mile along the east border (see Fig. 1). Following closely on *Salsola* comes *Elymus arenarius* L. on the east border, being practically absent on the west, where *Arenaria peploides* L. is found in a similar position (see transect). Extending round the peninsula in a practically unbroken chain is a band of *Psamma arenaria* Beauv., and *Triticum junceum* Beauv., about 10-12 yards wide. This band is only interrupted by the lifeboatmen's cottages, and by a steep bank about half-way along the west border.

#### 2. THE MARITIME HEATH.

This extends from the limits of cultivation north of Kilnsea Warren, down the isthmus, till the latter becomes so narrow that the bands of *Psamma* and *Triticum* extend from the east to the west borders, when it gives place to a scrub of *Hippophæ rhamnoides* L. The dominant plant of this heath is *Festuca elatior* var. *arundinacea* Schreb., and the following plants are typical :—

	Frequency		Frequency
<i>Plantago coronopus</i> L.	C	<i>Apium graveolens</i> L.	R
<i>Convolvulus Soldanella</i> L.	C	<i>Sedum acre</i> L.	C
<i>Myosotis collina</i> Hoffm.	O	<i>Chlora perfoliata</i> L.	O
<i>Cakile maritima</i> Scop.	R	<i>Crepis virens</i> L.	C

	Frequency		Frequency
<i>Helminthia echioides</i> Gaert	O	<i>Tragopogon pratensis</i> L.	R
<i>Erodium cicutarium</i> L'Her.	C	<i>Potentilla anserina</i> L.	O
<i>Daucus carota</i> L.	R	<i>Galium verum</i> L.	C
<i>Prunella vulgaris</i> L.	O	<i>Lotus corniculatus</i> L.	C
<i>Ononis arvensis</i> L.	O	<i>Orchis pyramidalis</i> L.	C
<i>Centaureium umbellatum</i> Gill	R	<i>Arctium lappa</i> L.	R
<i>Dipsacus sylvestris</i> L.	O	<i>Sonchus oleraceus</i> L.	O
<i>Trifolium arvense</i> L.	C	<i>Cichorium Intybus</i> L.	O
<i>T. striatum</i> L.	C	<i>Erigeron acre</i> L.	O
<i>T. scabrum</i> L.	C	<i>Ophrys apifera</i> L.	O
<i>Claytonia perfoliata</i> Don.	O		

C=Common. O=Occasional. R=Rare.

Of these, practically only *Plantago coronopus*, *Cakile maritima* and *Convolvulus Soldanella* may be regarded as typical sea-coast plants. Water is never seen standing on land in this neighbourhood, and frequently the plants are very stunted (particularly in the vicinity of the ruined Warren Cottage). There is a curious ring-shaped depression about 100 yards south-east of Warren Cottage, which is filled with water, but it seems probable that this was lined with clay during the period of the late war. Mr. W. E. L. Wattam has named the following lichens, which were collected in this region:—*Peltigera canina* Hoffm., *Cladonia pyxidata* Fr., *C. gracilis* Willd., *Cladina sylvatica* Nyl., and *C. uncialis* Nyl.

### 3. THE SHRUB ASSOCIATION.

The heath ends just south of a black, square hut, built in a shallow pit dug out of the sand, which appeared to be the most permanent landmark, as the groyne on the east border were in process of sanding up, and new ones were being built in 1925. A strip of *Hippophæ rhamnoides* follows, and, as there was good reason to suppose this shrub is extending northwards, this strip was measured with a Gunter chain, and found to be 60·5 metres long along the line of the railway track, its northern limit being 10 metres south from the above-mentioned black hut. After another strip, 40 metres long, in which *Psamma* and *Triticum* dominate from border to border, is a strip where *Eryngium maritimum* L. is dominant. This strip is 101 metres long on the line of the railway, and is followed by another of *Hippophæ* 120·5 metres long along the rails. From this region to Spurn village is typical sand dune scrub, with *Hippophæ rhamnoides* dominant, but with Elder (*Sambucus nigra* L.), Hemlock (*Conium maculatum* L.), and Woody Nightshade (*Solanum Dulcamara* L.) locally dominant, the two latter being practically confined to areas only a few yards square (see Fig. 1). Near the village

attempts at cultivation in small plots have been made; potatoes, French beans and peas being grown in the early spring. About a month before new potatoes were on the market in surrounding districts, there was a limited supply of new potatoes in Spurn village. On the waste land surrounding these plots Lamb's Lettuce (*Valerianella olitoria* Poll.) is found towards the west borders, and just to the north of the village Sand Timothy (*Phleum arenarium* L.) is found just to the east of the railway track.

#### 4. THE SALT MARSH ASSOCIATION.

This is found in what was formerly a creek deep enough to float a vessel, but which is now silted up, only a very limited area being now ever covered by the sea, and then only by extraordinary tides. A chalk bank has been thrown across this depression, but during the highest tides a small area inside the wall is covered with salt water, and here a very dwarfed association of *Glaux maritima* L. and *Salicornia herbacea* L. has appeared. The plants are dwarfed owing to the frequent drying up of this part of the salt marsh. On the Humber side of the wall, however, the vegetation is much more abundant, consisting mainly of *Atriplex portulacoides* L.

#### 5. THE FLORA OF THE HEAD.

One of the most striking features of this flora is a patch of Lucerne (*Medicago sativa* L.) along the west bank. I am told by Mr. Medforth Hodgson, the Yorkshire Naturalists' Union bird watcher, who has lived on Spurn or at Kilnsea for 25 years, that during the war clay was brought from Kilnsea and spread at various places, and Lucerne was sown on the head. I gather that this is the only place where it has persisted. The presence of clay would account for the presence of Lucerne in this locality,\* for it is a crop which requires heavy soil, and American farmers are advised to test land which they intend to lay down to Lucerne to see whether it is alkaline to litmus. A poor, thin, probably acid sand is unlikely to produce such a crop as was seen in August, 1925. The head of the peninsula is somewhat saucer-shaped, and vegetation within this area is very sparse, as sand is continually being blown in and removed again. One or two bushes of *Cytisus scoparius* Link. were noticed.

Twenty-five years ago there were not many bushes on the isthmus. Elder appeared first, being closely followed by an odd blackberry or two. It is hoped in the coming summer to make accurate counts of the number of these bushes on the

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\* Lucerne is commonly grown in surrounding districts, e g., Patrington Haven, Sunk Island and Easington, on heavy clay land.

isthmus in order to form a basis for future comparison. About forty years ago a bush of *Hippophæ* appeared near the village. Now it is the most conspicuous plant of the peninsula, and, 'together with *Psamma arenaria* and *Triticum junceum*, is responsible for the consolidation of the isthmus' (see J. F. Robinson 'Flora E. R. Yorks.'). It was with the object of providing a record for future reference that the present limits of the advancing zones were fixed in 1925. There are two isolated patches quite close to Warren Cottage (see Fig. 1). The local idea that the *Hippophæ* has come from the Falkland Islands does not seem to be at all likely, as it grows freely along parts of our east coast, notably at North Berwick (Mr. Wattam), Lincolnshire coast, Norfolk and Kent, and also in Holland.\* It readily sets seed in our climate, there being a beautiful display of orange-coloured berries in October, 1924. Each berry contains two seeds, surrounded by a sticky substance, and it seems probable that the seeds are distributed by this fruit becoming attached to the feet or wings of sea birds.

In conclusion, I should like to express my sincere thanks to Mr. Wattam for naming various specimens, and to Mr. J. F. Robinson for valuable information and suggestions.

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**Abnormal Chaffinches Nest.**—In the early part of May, 1926, I found a nest of a Chaffinch in a small bare hazel bush growing by the stream side, near the north end of Forge Valley, where it caught the full force of the keen north and east winds then prevailing. The nest was of the usual type in construction and material. Five eggs were laid, and these hatched on May 21st. The bitterly cold winds sweeping down the valley had made the newly hatched birds very starved and torpid when I saw them on the day of their birth. Passing the nest again on the 24th, I was surprised to find that the parent bird had erected a very efficient windscreen on the north side of the nest, converting it from an open cup into three-quarters of a sphere. The additional structure was composed of cows' hair felted together, with the addition of several feathers. Next morning I took the camera and got a picture of the unusual arrangement, and it was fortunate that I did so, for warmer weather setting in, I found, when I looked at the nest on May 28th, that the necessity for its presence having ceased, the old birds had entirely removed the extra material, reconverting the nest into an open cup once more.—W. J. CLARKE.

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\* One of the commonest shrubs on the Frisian Islands (North Holland)—the 'duindorn' (Dunethorn) of the Dutch. Personally, I first saw *Hippophæ* at Spurn on 18th August, 1888, and it was then well established.—J. F. ROBINSON.

## FIELD NOTES.

**Everthorpe Hoard of Bronze Axes.**—Referring to the notes in this journal for November, 1923, and July, 1926, Professor Desch, of The University, Sheffield, has made an examination of the portions of the metal found in the crucibles, and has since carefully analysed one of the celts from the Everthorpe Hoard. The material in the crucibles, of which three large lumps exist, is practically pure copper, whereas other minerals have been mixed with this before the axes were cast. It will be seen from the following analysis, which Professor Desch has made, that roughly more than two-thirds only of the metal forming the celt consists of copper, more than a sixth consists of lead, the remainder being largely tin.

## ANALYSIS OF BRONZE SOCKETED CELT, No. 121, EVERTHORPE.

Copper	...	...	...	66.88
Tin	...	...	...	10.54
Lead	...	...	...	22.36
Iron	...	...	...	Nil.
Nickel	...	...	...	Trace
Silica	...	...	...	Trace
Sulphur	...	...	...	0.18

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99.96

In his report Professor Desch says: 'The case of Everthorpe is peculiarly interesting, as there is no doubt that the irregular lumps from that hoard consisted of pure copper, and the inference seems fairly clear that this copper was afterwards alloyed. The object 121 has evidently been made from pure copper, but the amount of lead added is quite remarkable. I do not remember examining another specimen with so much lead.'—T. SHEPPARD.

**Albinism in Owls.**—Mr. Walter Armitage has presented to the Oldham Museum a partly albino Long-eared Owl, shot about 1894, at Bowes, in Yorkshire, and stuffed by J. Barlow, of Newton Heath, for the collection of Mr. Buckley, The Nook, Greenfield. When I first examined the bird in 1904 the plumage was normal, with the exception of conspicuous blotches of pure white on the back, wings, tail, belly, and under tail coverts. My notebook of that date describes it as 'a strikingly handsome bird.' Since 1904 the bird in its glass shade has been exposed to sunlight, and is now so much bleached on one side that the albino areas are hardly apparent until the concealed parts of the plumage are examined. The claws and the tips of the mandible are pale buff, instead of the dark horn colour in normal specimens. Although colour variations are frequent in many

species of owls, albinism is so extremely rare that to the best of my knowledge the only other British specimen is a Norfolk Long-eared Owl, pied with white, and recorded by Mr. J. H. Gurney many years ago. An albino Little Owl was seen on the wing in Holland, and partly or wholly albino Little Owls have been recorded in Italy (*cf.* H. H. Giglioli, 'The Strange Case of *Athene chiaradiæ*,' *Ibis*, 1903, pp. 1-18 and 137-8).—FREDK. J. STUBBS.

**Yorkshire Diptera.**—Mr. Percy H. Grimshaw, has put Yorkshire dipterists still deeper in his debt by sending a further consignment of flies to be added to the type collection he previously gave to us. Our warmest thanks are due to him for this generous gift.—CHRIS. A. CHEETHAM.

**Bird Notes from Driffield.**—Mr. W. R. Braithwaite, of Driffield, informs me that the Dipper has been seen on the Driffield becks, that Herons are multiplying in the district, and that the Brown Owl is quite common. He found the nest of a Dabchick containing two eggs, but this had been rifled on his next visit. A larch wood much frequented by Starlings was uprooted, and the bird droppings were so plentiful that it was shovelled into heaps and sold as manure.—J. NICHOLSON.

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**Friends of Field and Forest**, by Eleanor E. Helme. London : The Religious Tract Society, 95 pp., 7/6. This is a well-printed and beautifully illustrated volume, with large type, and charmingly-coloured illustrations of common British mammals, mounted upon tinted boards. These are by Barbara Briggs. It will prove to be an attractive gift book for a young naturalist, and is splendidly produced.

**Oilfield Exploration and Development**, by A. Beeby Thompson. London : Crosby, Lockwood & Son. 1925, 2 Vols. Mr. A. Beeby Thompson's latest work represents the results of investigations for over twenty-five years in most of the recognised oilfields of the world. The author is well known as an enthusiast in his subject, and can certainly be congratulated upon the production of one of the best works on Petroleum yet published. 'Oilfield Exploration and Development' has been divided conveniently into two volumes, the first dealing entirely with the principles of the subject and the second with the important practical side of oilfield work. Both are well illustrated by photographs, maps and diagrams, and there is a pleasing lack of statistics, tables, and conventional geological diagrams which so often mar otherwise good treatises on petroleum. The author assumes at the outset that the reader has a thorough knowledge of geology and engineering, and hence does not attempt to deal with his subject in an elementary manner. The work of a petroleum geologist is clearly defined, and although the author insists that the geologist should be able on occasion to prepare his own field maps it is made clear that pure topographical work is of secondary importance to the knowledge and application of the principles of stratigraphical geology. The question of the origin of oil is debated with thoroughness, and the author has drawn freely upon all literature relating to this interesting problem. Mr. Thompson has little faith in the inorganic theory of the origin of petroleum, and his summary of conclusions

suggests that the origin of this substance must be ascribed to organic media, either animal or vegetable. The geographical and geological distribution of oil is dealt with in detail, and it is evident that the geological distribution of petroleum is closely allied to certain epochs connected with geosynclinal conditions. Typical geological structures governing the accumulation of oil in stratified rocks, and a brief account of the principal oilfields of the world, are described along with personal observations by the author on special technological problems.

Volume 2. of this treatise (*Oilfield Practice*) deals entirely with the practical side of the petroleum industry, and includes modern types of drilling apparatus, production methods and general oilfield practice. Special attention has been given to such topics as the presence of water in association with oilsands, the exhaustion of oil horizons, the reduction of oilfield waste, etc. The arrangement of the book is excellent, and there is a good index. Certain maps, however, are not in harmony with the general high standard of the treatise, and the shaded portions (presumably intended to indicate oilfields) are not always accurate. In Ecuador, for example, the only producing field is in the immediate vicinity of St. Elena, (mis-spelt, Helena on the map) and by no means extends so far north and south as is suggested by the shading. It is new to the reviewer, also, to learn that (in Ecuador) in reference to the Ancon field 'further northwards *along the strike* certain deep producers have been drilled.' The depths also at which oil has been struck in this field, according to the author, have not been revealed by past drilling.—G.S.

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**Zoological Notes from Whitby.**—The following have come from the fishing grounds off Whitby :—Pogge (*Agonus cataphractus*), length 5in., May 24th; a young four-horned Cottus (*Cottus quadricornis*), length 4in., June 2nd; a circular Crab on May 24th; another on June 19th. On June 16th I procured an Embleton's Galathea (*Galathea neca*). All these had been kept over for us by the fishermen. On May 7th I found a large specimen of the shell, *Crenella nigra*, on board one of the trawlers. It had been trawled up off Whitby.—J. A. STEVENSON.

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Mr. E. Hawkesworth has been elected President of the Leeds Literary and Philosophical Society, in which for many years he has taken a keen interest.

A lady has been excavating at Gibraltar, and has found portions of a human skull. She is bringing the pieces to England to be examined, but, according to the press, they are already 20,000 years old. Now, how does the lady know that?

Mrs. Malaprop was visiting the local museum. She was espied by her neighbour, Mrs. Jones, who went over to her side and expressed surprise at seeing her there, as she did not think she would be interested in such things. 'Oh! yes, my dear, I am,' said Mrs. Malaprop, 'I just delight in iniquities.'

At the Southampton meeting of the British Association, Colonel E. M. Jack read a paper on 'The Work of the Ordnance Survey,' which was published with Captain J. G. Withycombe's 'Recent Productions of the Ordnance Survey,' and Mr. O. G. S. Crawford's 'Notes on Archæology and the Ordnance Survey.' This and other information is given in a pamphlet entitled 'The Work of the Ordnance Survey' (H.M. Stationery Office, 13 pp., 9d.).

## REMAINS IN THE PEAT OF THE SOUTHERN PENNINES.

T. W. WOODHEAD AND O. G. E. ERDTMAN.

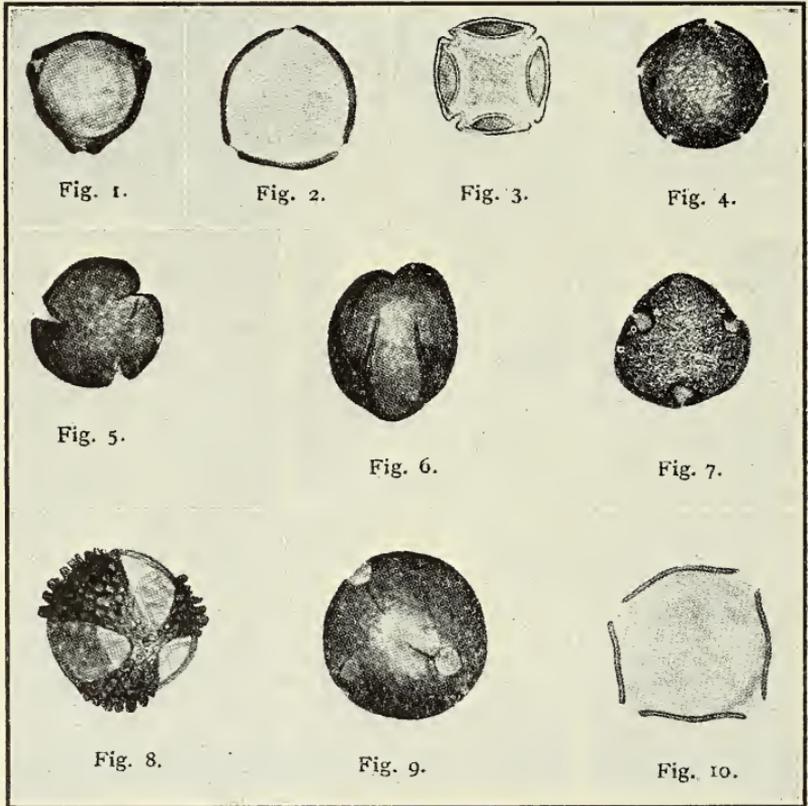
IN recent years, considerable interest has been taken in the remains in the peat deposits of Yorkshire, especially in the Southern Pennines, and already the results are helping towards a better knowledge of their history and development. A recent visit of Dr. Erdtman to this country provided an opportunity of applying the 'pollen-statistics' method to an area at Warcock Hill, Marsden, near Huddersfield, which has already yielded objects of considerable archæological interest as the result of excavations carried out by Mr. Francis Buckley.

The peat of the Southern Pennines is formed largely by cotton grass, the chief peat former being *Eriophorum vaginatum*. Sphagnum peat hardly occurs at all, and then in very restricted areas. Over the greater part of the area peat formation is not taking place, on the contrary, retrogression is going on rapidly over many square miles, and in many parts the peat has been entirely removed, leaving the bare subsoil exposed. This process has been hastened locally by severe burning.

The depth of the peat varies from a few inches to ten or more feet. As Burrell (3) and others have pointed out, no case has yet been found of the occurrence of arctic plants, or of lamination in this peat, indicating periods of varying climate comparable to those described by Lewis in North Yorkshire (9) and in Scotland (10). Woodhead has shown (14) that tree remains, chiefly birch, and to a much less extent, pine, are widely distributed over the Pennines, and occur on high exposed summits, now quite treeless, like Pule Hill, Marsden (1400 feet, O.D.), and he has identified remains of *Calluna*, oak, and birch, in the subsoil beneath the peat among flint tools attributable to the Tardenois period. Miss Whitaker has also obtained, from the subsoil beneath the peat in the Cleveland, pollen grains of pine, birch, and hazel; and Burrell described some micro-fossils from the Pennine peat, including pollen grains of 'Betula-Corylus' type. The pollen grains of *Betula*, however, can be distinguished from those of *Corylus*, and he figures a typical *Betula* pollen grain with three prominent pores (3, fig. k, Pl. X.) We give here (Fig. 1.) illustrations of a number of pollen grains (1 to 10) of the trees most commonly met with in the peat of the area covered by Erdtman's investigations, from the plate in his paper (7) in the *Proceedings of the Liverpool Geological Society*, 1925. Number 2 of this series shows a typical hazel pollen grain, and may be compared with that of the birch (No. 1). Burrell's figure j, Pl. X., shows a pollen grain of *Tilia*, but it was not identified by him. Burrell states that pine pollen grains (which

he figures, I., Pl. X.), are most plentiful in the subsoil and near the base of the peat ; this is confirmed by our observations, but the statement that ' pine pollen is frequent throughout ' (3, p. 48), is not confirmed, as reference to Erdtman's pollen-statistics diagrams will show.

The archæological finds have been described by Buckley (2), Petch (12), and Woodhead (14). The most interesting of these finds have occurred at Warcock Hill, Marsden, where two workshop sites have been carefully excavated by Buckley.



**Fig. 1.—Illustrations of Pollen grains.**

Figs. 1, birch; 2, hazel; 3, alder; 4, elm; 5 and 6, oak; 7, lime; 8, holly; 9, beech; 10, hornbeam.

5 mm. in the figures represents 10  $\mu$ .

Recently the present writers, along with Mr. Buckley, have made further examinations of the peat remains of this area. The peat here is from two to six feet in thickness, and rests on the sandy shales of the Millstone Grit Series. In the subsoil of grey sand, five inches in thickness, were found two flint workshop floors (Fig. 2). In the lower one were early ' Belgian ' Tardenois flint tools, along with debris of unpatinated chippings.

Associated with these were numerous pieces of charcoal, which, on examination, proved to be oak and birch. Above this occurred a second workshop floor with later 'Belgian' Tardenois tools, also flint debris and charcoal of birch. The flint on this site, however, was patinated white, in strong contrast to that of the lower floor. These two floors, of which the older produced unpatinated, and the later one

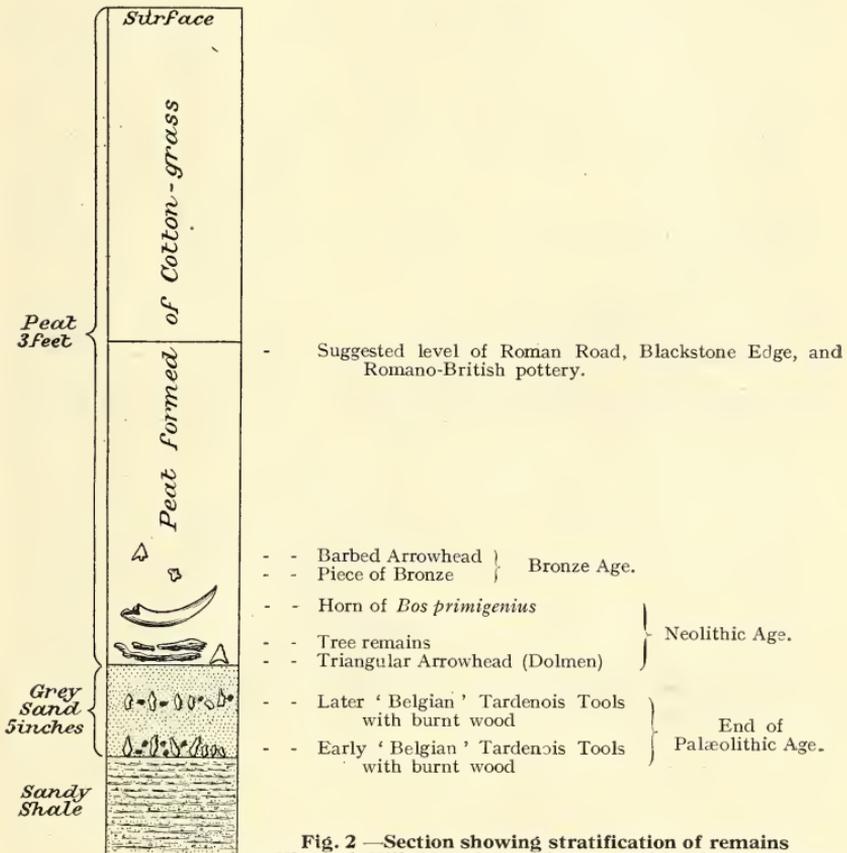


Fig. 2 — Section showing stratification of remains at Warcock Hill, Marsden, and suggested level of Romano-British floor.

patinated flints, suggested the increase of wetter conditions (14, p. 302), and this seems to be borne out by pollen-statistics when comparison is made with other deposits.

Resting on this subsoil is the 'forest' layer consisting mainly of the remains of birch. At this level Buckley found Neolithic tools, and triangular and leaf-shaped arrowheads. At a higher level in the peat (see Fig. 2) occurred a horn case of *Bos primigenius*, also a piece of bronze and a Bronze Age arrowhead. These objects, presented by Mr. Buckley, are now in the Tolson Memorial Museum, Huddersfield. Peaty

fragments scraped from the above horn were examined, and 146 pollen grains were counted in this material, these included 46 pollen grains of *Betula*, 46 of *Corylus*, 40 of *Alnus*, 12 of *Quercus*, 1 of *Tilia*, and 1 of *Ulmus*. In Scandinavia, von Post has specially shown that pollen-spectra obtained from analyses of even a few square millimetres of peat adhering to archæological and other objects, can be used for dating and synchronizing, and this might naturally be applicable to deposits in Britain, especially when dealing with ancient (pre-Atlantic) material, because of the greater pollen frequency and the more characteristic changes of pollen curves in diagrams from deposits of such an age.

Figure 3 shows the pollen diagram from the shallow peat

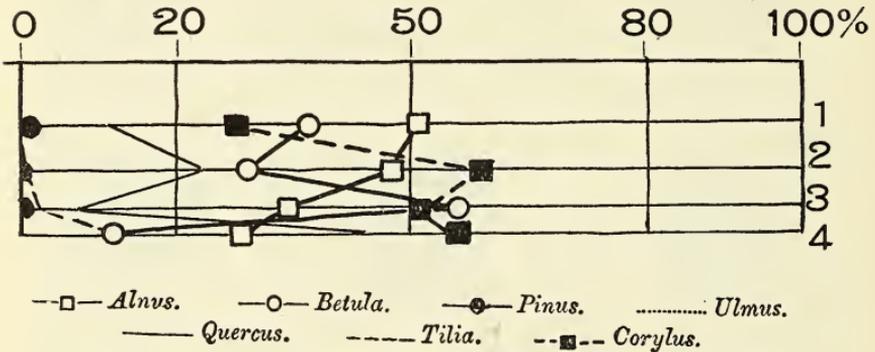


Fig. 3.—Pollen Diagram from Warcock Hill, Marsden. 'North site.'

deposit on Warcock Hill, obtained from Buckley's 'North Site' (2, p. 5). Four successive samples were taken, as indicated by the figures on the right of the diagram; the percentages of pollen grains are shown in the horizontal scale, and the several species of trees found are indicated by signs, an index of which is given below. Sample 4 from peat mixed with subsoil shows a strikingly high percentage of oak pollen, just as do samples from Leasowe submerged forest (Upper Forest Bed). This tends to confirm the determination of the oak charcoal from this subsoil mentioned above.

Figure 4 shows a pollen diagram from the deeper peat on Warcock Hill, and was obtained about 300 yards S.E. of the flint workshop site. The numbers on the right (1 to 11) indicate the sample numbers, those on the left the depth of the deposit in metres. (The triangle to the left of the diagram, sample 2, indicates beech, *Fagus*.)

As will be seen from these diagrams, the peat of Warcock Hill, as elsewhere in the Southern Pennines, does not exhibit any of the characteristics of Boreal deposits. On the contrary, the finding of Neolithic tools, the low and quickly disappearing

pine pollen percentage, the high percentage of alder and oak pollen, the presence of lime pollen, etc., indicate that the base of the peat was formed during the Atlantic period. Many submerged forests, *e.g.*, at Leasowe and Hightown in Cheshire, Highbridge in Somerset, Paignton in Devon, Ambleteuse and Wissant between Boulogne and Calais, etc., the bottom of the

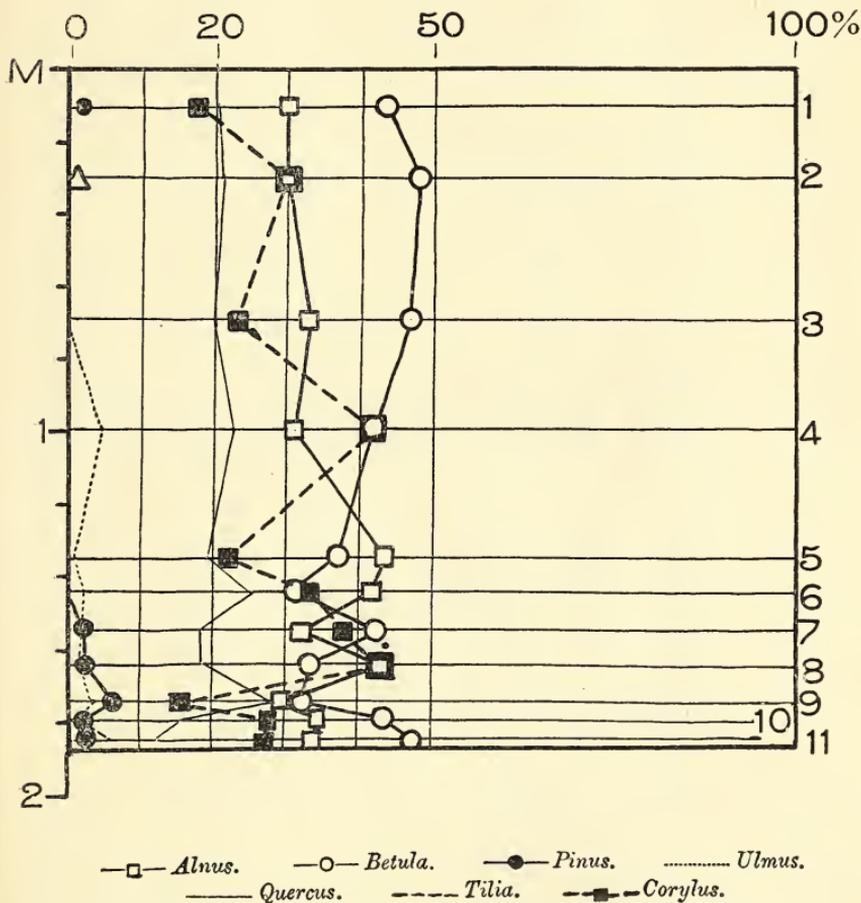


Fig. 4.—Pollen diagram from Warcock Hill, Marsden, 300 yds. S.E. of 'North site.'

peat in the Fens at Ely, the buried (carr) forests of the Norfolk Broads at Wroxham, the base of the 25 ft. raised beach mosses of Wigtownshire, *e.g.*, the Moss of Cree, and Lochar Moss, Dumfriesshire; also the Lonsdale lowland moors, Ellerdale Moss, White Moss, and others, all these exhibit a close pollen floristic resemblance to that at the base of the Pennine peat, and, therefore, might be regarded as fairly contemporaneous. Some of these deposits are very deep, *e.g.*, Lochar Moss, 24

feet or slightly more ; thus if comparison be made with the Warcock Hill peat it suggests that the rate of growth of peat varies very considerably, as pointed out by Moss (11) and others.

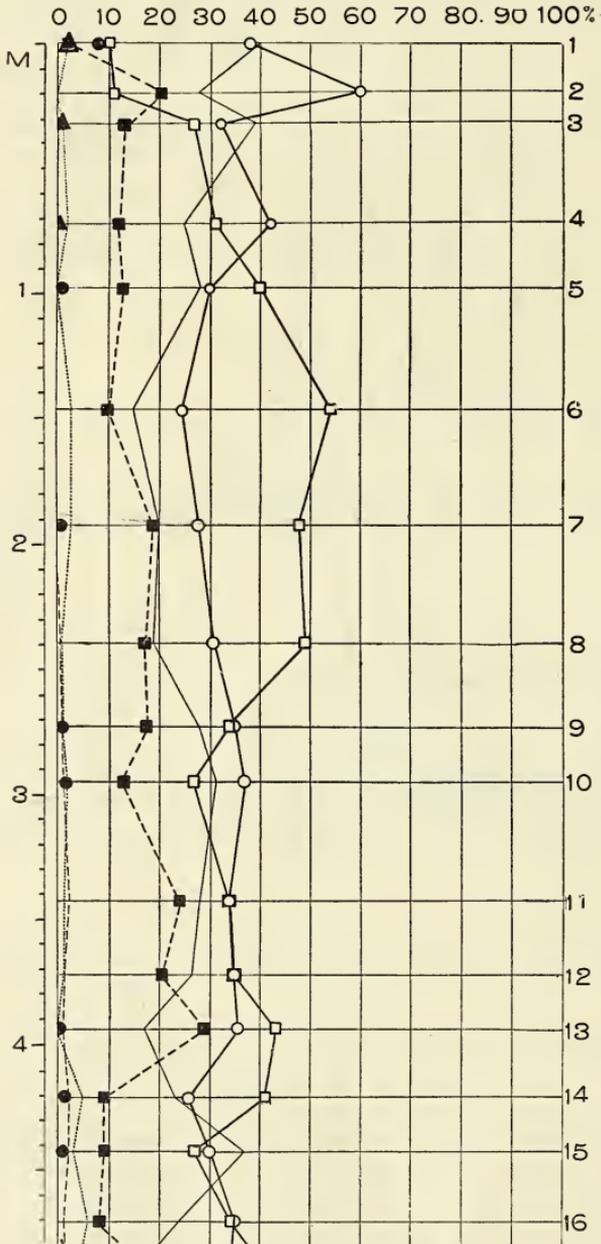


Fig. 5. (Continued on next page.)

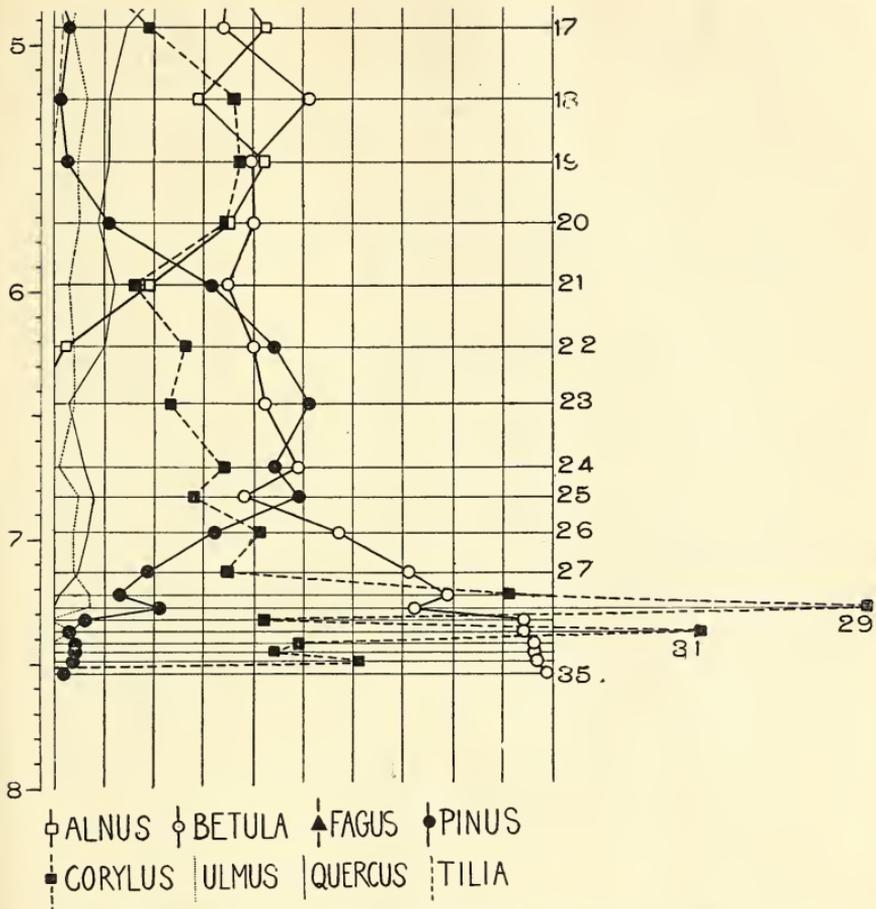


Fig 5.—Pollen diagram from Chat Moss, near Manchester.  
 A single pollen grain of holly was found in sample 5 (left of diagram).

Near the surface of the Warcock Hill peat we notice the appearance of beech pollen, as indicated by the triangle in sample 2 of Fig. 4, and pine pollen reappears in sample 1. The pollen frequency shows a rapid decrease in the upper (post-Atlantic) layers, indicating the destruction of the forests, and at last, the treeless condition we see to-day.

The post-Atlantic Period in Scandinavia is, according to Blytt and Sernander, divided into sub-Boreal and sub-Atlantic, the former including the late Neolithic and the Bronze Age, the latter the Iron Age, from about 800 B.C. to historical times.

Pollen statistic investigations, carried out on the lines indicated by Erdtman in the *Linnean Journal* (Vol. XLVI., 1924) have now been made for selected parts of Scotland, Ireland, and England, and the pollen diagrams obtained, visualising by means of pollen curves, the variation of the

relative frequency of the pollen grains of forest trees in successive layers in deposits of peat, mud, marl, etc., exhibit close resemblance to those of S.W. Sweden. As recently suggested by Erdtman (7), the order of immigration of trees seems to have been the same all over Britain, viz., birch seems to have been the first dominant tree, then pine and willows, following these came hazel, elm, oak, alder, lime, beech, and hornbeam. It is suggested that holly is not younger than elm, oak and alder. (See *Svensk Botanisk Tidskrift*, p. 453, 1924, and p. 276, 1926).

After the immigration of the alder, as indicated by the presence of pollen grains in the peat, a rapid diminution of the pine forests began. This is visualised in the pollen diagram of peat from Chat Moss, near Manchester (Fig. 5), an illustration we are able to reproduce by arrangement with Dr. A. B. Rendle (*Journ. of Bot.*, March, 1926). There are many facts which favour the idea that the disappearance of the pine forests took place in late Boreal and early Atlantic times. Within the warm continental Boreal period the epi-Palæolithic (Mas d'Azil-Tardenois) period seems to occur, as suggested by Wright (15), Brooks (1, p. 327), and Gams and Nordhagen (8). This corresponds to the *Ancylus* stage of the Baltic. During the Atlantic period the climate was moist and damp. According to recent Swedish investigations by von Post (13), the Post-Glacial optimum climate of Sweden falls in that period. The Atlantic period corresponds to the *Littorina* stage of the Baltic and might, according to Gerard de Geer (4) have lasted about 3000 years (ca. 5200 B.C. to 2200 B.C.).

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### BOOK NOTICE.\*

Time was when it was possible to pick up a certain type of ammonite from the Kimmeridge Clay, and without much fear of contradiction say *Ammonites bplex*. Since then the researches of specialists have made it necessary that instead of the name quoted we should say it is either one or other of the following *genera*, *Virgatosphinctoides*, *Allovirgatites*, *Sphinctoceras*, *Pectinatites*, *Paravirgatites*, *Wheatleyites*, *Pallasiceras*, *Holcosphinctes*, *Episphinctoceras*, *Aposphinctoceras*; but as for the *species*, Dr. Neaverson and possibly one other only know! In this magnificently illustrated memoir Dr. Neaverson gives a useful history of the growth and evolution of the nomenclature of Kimmeridgian Ammonites. He has devoted some time examining about 300 different specimens from various localities, and as a result has described new genera and new species, principally from Dorset, Shot-over-Hill, Norfolk, Lincolnshire, Oxford, Buckinghamshire, etc. The Holderness Drift has also given its quota to this valuable memoir.

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\* 'Ammonites from the Upper Kimmeridge Clay,' by E. Neaverson. University Press of Liverpool, Ltd., and Hodder & Stoughton, Ltd., London, 53 pp., 10/6 net.

## YORKSHIRE COLEOPTERA, 1923—1925.

M. LAWSON THOMPSON, F.E.S.

*Chairman and Convener of the Yorkshire Coleoptera Committee.*

SOME notes of new localities reached me referring to uncommon insects captured during 1923, and three species have been added to the county list. A single specimen of *Sphaerites glabratus* L., recorded from Kildale, is only the third English record of this rare species. *Longitarsus holsatus* L., found near Cloughton the previous year by Mr. Fordham, and *Ceuthorrhynchus asperifoliarum* Gyll., met with in Duncombe Park, Helmsley, are the other two. The re-discovery of *Bledius dissimilis* Er. on the cliffs at Bridlington, and the occurrence of the rare *Acrulia inflata* in Forge Valley, Scarborough, give two other notable results of the season's work.

The year 1924 seems to have been a very unfavourable one for Coleoptera, and very few notes on Yorkshire were forthcoming. A single specimen of *Phyllodrepoidea crenata* Grav., taken in Arncliffe Wood, Glaisdale, is the most southern record for this Scotch insect up to the present time. Another addition was made by Mr. E. G. Bayford, who took an example of *Sphærosoma piliferum* Müll. at Wharnccliffe. He also obtained a number of the longicorn, *Tetropium gabrieli* Wiese var. *crawshayi* Shp., from larch planks imported into Barnsley. The re-discovery at Glaisdale of the rare water beetle, *Agabus melanarius* Aub., is also of interest.

Members of the Coleoptera Committee attended the excursions of the Union for 1925 at Egton Bridge, Middleton-in-Teesdale, Askham Bog, Malham, and Coxley Valley. At the first of these *Micrurula melanocephala* Marsh. was met with. The weather conditions were very adverse at Middleton-in-Teesdale, and the only species of interest obtained were *Hister 12-striatus* Schr. and *Orchestes foliorum*. At Askham Bog one species, *Galerucella lineola* F., was added to the Yorkshire list, and two others, *Philonthus micans* Grav., and *Anisosticta 19-punctata* L., to the vice-county. About a dozen species were added to the county list, particulars of which will be found below.

I wish to express my indebtedness to the Yorkshire coleopterists mentioned below for their kindly help in preparing the report by furnishing me with lists of their captures, together with valuable information on distribution and habitats.

The abbreviations, etc., are as follows :—

† = New to the county.  
 E.G.B. = E. G. Bayford.  
 J.M.B. = J. M. Brown.  
 J.R.D. = J. R. Dibb.  
 W.J.F. = W. J. Fordham.  
 W.D.H. = W. D. Hincks.

\* = New to the vice-county.  
 T.B.K. = T. B. Kitchen.  
 T.S. = T. Stainforth.  
 M.L.T. = M. L. Thompson.  
 G.B.W. = G. B. Walsh.  
 A.E.W. = A. E. Winter.

- Cychrus rostratus* L. Adel, 1923. W.D.H.  
*Carabus granulatus* L. Askern, 1923. A.E.W.  
*Leistus spinibarbis* F. Rievaulx, 1923. T.B.K.  
*Notiophilus hypocrita* Putz. Scalby High Moor and Seamer Moor, 1925. G.B.W.  
*Dyschirius politus* Dej. Bridlington, 1923. G.B.W.  
*D. globosus* Herbst. Askern and Kirk Hammerton, 1923. A.E.W.  
*Miscodera arctica* Payk. Haworth Moor, 1923 (E.G.B.); Ilkley Moor, 1922 (W.D.H.).  
*Bembidium littorale* Oliv. (*paludosum* Panz.). Banks of the Nidd near Mill, Kirk Hammerton, September, 1923. A.E.W.  
† *Epus robinii* Lab. On the shore at Robin Hood's Bay, August and September, 1925. T.S. and G.B.W.  
\* *Patrobis assimilis* Chaud. Moor at Burton Head, near Ingleby, June, 1921. M.L.T.  
*Ophonus brevicollis* Dej. East Ayton, near Scarborough, 1925. G.B.W.  
*Acupalpus exiguus* Dej. Skipwith Common, June, 1923. M.L.T.  
*Pterostichus lepidus* L. Moor near Stainton Dale, May, 1923. A.E.W.  
*P. vernalis* Panz. Askern, June, 1923. A.E.W.  
*Agonum viduum* Panz. var. *moestum* Duft. Askern, June, 1923. A.E.W.  
*A. micans* Nic. Banks of Tees, near Yarm, 1923 (M.L.T.); Adel Dam, 1924 (W.D.H.).  
*Lebia chlorocephala* Hoff. Sandsend, nr. Whitby, August, 1925. J.M.B.  
*Cymindis vaporariorum* L. Ringinglow, near Sheffield, under heather, June, 1923. J.M.B.  
*Hygrobia (Pelobius) tarda* Hbst. Common in a pond at Hedon, 1923. T.S.  
\* *Hydroporus obsoletus* Aub. Mickle Fell in Upper Teesdale, 1923. G.B.W.  
\* *Agabus congener* Payk. Skipwith Common, August, 1922. T.B.K.  
*A. melanarius* Aub. Arncliffe Wood, Glaisdale, in a small pool, September, 1924. M.L.T.  
*Copelatus ruficollis* Schab. (*agilis* F.). Common in a brick pond at Cottingham Road, Hull, June, 1923. T.S.  
\* *Hydræna nigrita* Germ. Dutton, near Barnard Castle, 1923. G.B.W.  
*Cercyon pygmaeus* Ill. Cayton Bay, 1923. G.B.W.  
*Aleochara ruficornis* Grav. Ramsdale Wood, Robin Hood's Bay, June, 1924. M.L.T.  
\* *A. moesta* Grav. Arncliffe Wood, Glaisdale, one specimen in rotten wood of hollow tree, September, 1925, a rare insect. M.L.T.  
*Oxypoda spectabilis* Märk. Roundhay Park, Leeds, 1921. W.D.H.  
*Aitheta britteni* Shp. Sherburn, near Scarborough, abundant in flood refuse, 1923. G.B.W.  
*A. inoptata* Shp. Welwick, 1925. G.B.W.  
† *A. marcida* Grav. Givendale, in fungi, 1925. G.B.W.  
† *A. corvina* L. Givendale, in fungi, 1925. G.B.W.  
† *A. sodalis* Grav. Givendale, in fungi, 1925. G.B.W.  
† *A. cavifrons* Shp. Sherburn, near Scarborough, in flood refuse, 1925. G.B.W.  
† *Sipalia cæsula* Grav. Givendale, in fungi, 1925. G.B.W.  
*Gymnusa brevicollis* Payk. Skipwith Common, June, 1923. M.L.T.  
*Tachinus subterraneus* L. Leeds district, 1925. W.D.H.  
\* *Mycetoporus longulus* Man. Leeds, 1921. W.D.H.  
*Heterothops binotata* Grav. Leeds, 1923. W.D.H.  
*Quedius nigrocæruleus* Reg. Ganton, near Scarborough, bred from moles' nests, 1923. G.B.W.  
*Quedius lævigatus* Gyll. Forge Valley, 1923. G.B.W.  
*Q. scintillans* Grav. Scarborough, 1925. G.B.W.  
† *Q. fulvicollis* Steph. In sphagnum on Cronkley Fell in Upper Teesdale, July, 1925. M.L.T.

- Staphylinus pubescens* De G. Bilton, Harrogate, 1923. A.E.W.  
*Philonthus chalceus* Steph. (*proximus* Kr.). Raincliffe Wood, near Scarborough, in caison, 1923. G.B.W.
- \**P. micans* Grav. Askham Bog, in moss, June, 1925. M.L.T. & G.B.W.  
 \**P. fulvipes* F. Banks of the Rye at Helmsley amongst wet shingle, May, 1923. M.L.T.
- \**Bledius fuscipes* Rye. Banks of the Nidd near Mill, Kirk Hammerton, September, 1923. A.E.W.  
*B. dissimilis* Er. On the coast at Bridlington in abundance, August, 1923. T. Hudson Beare and H. Donisthorpe.  
*Trogophlæus elongatus* Er. Askham Bog, 1925. G.B.W.  
*T. corticinus* Grav. Askham Bog, 1925. G.B.W.  
*Deleaster dichrous* Grav. One specimen of the type form on a rock in Scalby Beck, 1925. G.B.W.
- \**Syntomium æneum* Müll. Ryecroft Glen, 1923. J.M.B.  
*Olophrum consimile* Gyll. Seamer Moor, two specimens in moss, 1925. G.B.W. This confirms Lawson's record for the Scarborough district.
- †*Phyllodrepoidea (Deliphrum) crenata* Grav. Arncliffe Wood, Glaisdale, one specimen near larch trees on September 17th, 1924. M.L.T.
- \**Phyllodrepa vilis* Er. Blackmoor, near Leeds, 1923. W.D.H.  
*Acrulia inflata* Gyll. Forge Valley, 1923. G.B.W.  
 \**Pseudopsis sulcata* New. Roundhay, Leeds, April, 1922. W.D.H.  
*Choleva spadicea* Sturm. Hayburn Wyke, 1925. G.B.W.  
*Catops (Choleva) longulus* Kell. Arncliffe Wood, Glaisdale, one specimen in moss, September, 1925. M.L.T.
- †*Colon zebei* Kr. Forge Valley, a fine male swept in late October, 1923. G.B.W.
- †*C. denticulatum* Kr. Forge Valley, a male in 1925. G.B.W.  
*Liodes dubia* Kng. Danes' Dyke, Bridlington, 1925. G.B.W.  
*L. litura* Steph. (*punctulata* Brit. Cat.). Kildale, in Cleveland, September, 1923. M.L.T.  
*Agathidium lævigatum* Er. Blackmoor, near Leeds, 1923. W.D.H.  
*A. varians* Beck. Raincliffe Wood, near Scarborough, 1923. G.B.W.
- †*Clambus minutus* Sturm. Hill Green, 1925. G.B.W.  
*C. armadillo* De G. Thornton Dale, 1923. G.B.W.
- \**Ptenidium lævigatum* Gyll. Raincliffe Wood, in mole's nest, and Scarborough in wasps' nest, 1923. G.B.W.  
*Ptilium spencei* Athb. Thornton Dale, 1923. G.B.W.
- \**Hister 12-striatus* Sch. Near Middleton-in-Teesdale, 1925. J.M.B.
- †*Sphærites glabratus* F. In the gills of a growing fungus (an agaric) in a wood below the moor at Kildale in Cleveland. One specimen at the end of September, 1923. M.L.T. A rare insect.  
*Carpophilus sexpustulatus* F. Eccup, near Leeds, 1923 (W.D.H.); also at Doncaster, 1925 (W.D.H.).

(To be continued.)

—: o :—

In *The Entomologist's Record* for June Mr. T. F. Marriner describes a Hybrid Coccinellid.

Thomas Hay writes on 'Delta Formation in the English Lakes' in *The Geological Magazine* for July.

No. 159 of *The Scottish Naturalist* contains the familiar valuable report on Scottish Ornithology, this time for 1925; the Trout as the natural enemy of Crane-flies, and several interesting short notes.

'Hardening Solutions for Fragile Specimens,' by S. Hazzledine Warren, is the title of a paper in *The Proceedings of the Geologists' Association*, issued in June, which will be useful to collectors of delicate geological specimens.



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Vol. XXV., for 1923-1926.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S.

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# THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL  
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY  
**T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,**  
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and **T. W. WOODHEAD, Ph.D., M.Sc.**  
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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

**G. T. PORRITT, F.L.S., F.E.S.**

**JOHN W. TAYLOR, M.Sc.**

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## BRYOLOGICAL SECTION.

Owing to various Sectional Meetings occurring on October 30th, it has been thought desirable to postpone the Bryological Meeting arranged for that date until November 20th. Further details later. Members please note.

F. E. MILSOM,

*Convenor.*

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## NOTES AND COMMENTS.

EDGAR WAITE.

Many of the older Yorkshire Naturalists will remember Mr. Edgar Waite, who thirty-three years ago was Assistant Curator at the Leeds Museum, and then went to Australia to carry out curatorial duties in the Antipodes. He has recently made a return visit to England, and re-visited Leeds, when he was met by many of his old friends. The accompanying sketch is



by "Kester," in a record of this event appearing in *The Yorkshire Weekly Post* recently, and we are permitted to reproduce it. For a brief space Mr. Waite was on the editorial staff of *The Naturalist*, and joint Secretary of the Yorkshire Naturalists' Union.

PROF. P. F. KENDALL, D.S.C., F.R.S.

On presenting Emeritis Professor Percy Fry Kendall the Degree of Doctor of Science of the University of Leeds, *honoris causa*, recently, it was stated:—"To-day the University honours one who for more than thirty years served it most faithfully. Like many others whose names are famous in the annals of geological science, Percy Fry Kendall is a product of the old Science and Art Department, and in the year 1874, when the Yorkshire College was founded, he was awarded the

Silver Medal of the Department, this being the only occasion when such distinction was gained by a student in Geology. At the Science School, South Kensington, he came under the influence of two great teachers, Huxley in Biology and Judd in Geology, with the result that he was attracted to the biological aspects of Geology, and some of his earliest work was upon the fossil fauna of the Pliocene deposits of East Anglia. But it was not in this field that he was to achieve his best work. In the 'seventies and 'eighties the problems connected with the Ice Age were receiving much attention, and he, almost alone among the British Geologists, argued that these islands had once been covered by Land Ice as Greenland is to-day, his opponents being those who invoked submergence in an Arctic Sea, with abundance of icebergs, to transport the boulders so commonly found. Many a pitched battle was fought over this question in the Geology Section of the British Association meetings, the honours all resting eventually with Kendall, for to-day the Land Ice Theory is universally accepted by geologists—very largely due to his advocacy. He has been spoken of by a venerable Scottish geologist as a "bonnie fechter." His work upon the Glaciation of Cleveland was the starting point of similar investigations by his own students and others, all over the British Isles.'

#### ICE-AGE TO COAL.

'From Ice to Coal seems a far cry, but in 1905 he was called upon to give evidence before Lord Allerton's Coal Commission on the Extent of the Concealed Coalfield of East Yorkshire, and applying definite principles to the problem he estimated the area of the Concealed Coalfield at approximately three times that given by Professor Green, his predecessor in the Chair of Geology, before the Coal Commission of 1871. It is of especial interest at this time to state that this estimate has been almost completely vindicated by details of a boring which have been disclosed this year. The Geological Society of London recognised the value of his contributions to Geological Science by the award of the Lyell Medal in 1909, and in 1923 he was elected a Fellow of the Royal Society. Even the most meagre statement of his various activities must not omit mention of the tremendous impetus he has given to the study of geology among amateurs in Yorkshire. Kendall was never more happy than when tramping the Yorkshire Moors with members of Scientific Societies expounding the geology of the district he knows and loves so well. He is a past President of the Yorkshire Geological Society, the Yorkshire Naturalists' Union, as well as of several local Societies. He was also President of the Geology Section of the British Association in 1922, when the meeting was in Hull. Geologists everywhere,

but especially in Yorkshire, will acclaim the honour bestowed as one most richly deserved.' Personally we regret, more than we can say, the fact that Prof. Kendall has since left our county.

## DOWSING.

We take the following from a letter written to *The Observer* of June 20th: 'The United States Geological Survey published in 1917 a short pamphlet, called "The Divining Rod, a History of Water-witching" (Water Supply Paper 416, Government Printing Office, Washington), which contains a bibliography of nearly 600 books and papers on water-divining in several languages. The first 100 items on the list were published before 1700, the last 200 after 1900. The following quotations from the Introductory Note will show the attitude of the U.S. Geological Survey: "The use of a forked twig, or so-called divining-rod . . . . is a curious superstition that . . . . still has a strong hold on the popular mind, even in this country, as is shown by the large number of inquiries received each year . . . . as to its efficacy . . . . and the persistent demands that it be made a subject of investigation by the Survey. It is difficult to see how for practical purposes the whole matter could be more thoroughly discredited, and it should be obvious to everyone that further tests . . . . would be a misuse of public funds. To all inquirers the United States Geological Survey therefore gives the advice not to expend any money for the service of any 'water-witch' or for use or purchase of any machine or instrument devised for locating underground water or minerals.''

## THE NARWHAL.\*

'An advertisement, printed in the year 1800 by P. Boyle, of 14 Vine Street, Piccadilly, London, announces that the *Unicornu Marinum*, "that most wonderful and extraordinary fish, the only one ever seen in this kingdom, or in Europe (except about a hundred years ago, one was left by the tide on the German coast) can be seen now exhibiting at the next door to the Cannon Coffee House in Cockspur Street." The advertisement states that the example was "taken alive on the Frieston Shores, near Boston, Lincolnshire, on the 15th February, 1800, from which was extracted fifty-four gallons of fine oil." It continues: "This phenomenon is now in the highest state of preservation, and free from any smell; it is of a beautiful marbled colour, and of the highest polish; measures in its length twenty-four feet and a half, including an Ivory Horn of seven feet six inches long; girth eight feet; and when alive was upwards of forty hundredweight. Upon its road to town it has met with the most distinguished

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\* From *The Journal of the Manx Museum* for June.

approbation, as the greatest curiosity, particularly at the University of Cambridge.”

A ‘FOUL,’ SURELY!

We quote the following precisely as it appeared in the press recently: ‘FLESH, FISH OR FOWL?—FISHERMEN’S STRANGE FIND IN TRAWL NET.—A strange denizen of the deep was caught by two fishermen who were trawling in a motor boat some three miles out of Falmouth. On hauling up the trawl, which took them over an hour, owing to the weight of the “catch,” they found in the net a creature which they estimated was 20 feet long, with a tail over 8 feet long. It had a beak six inches wide and two feet in length, and had four legs. Its body was protected with thick scales—the fishermen described them as being like “armour plates”—and its broad, flat back was covered with matted brown hair. The fishermen, who were alarmed at the violent struggles, and the size of the monster, were undecided whether to attempt to land it or to let it go free again. The question was settled by the creature itself, which, with a great wrench, tore the net and escaped. The water was tinted with blood from wounds which had been caused in the struggle. Experts at Plymouth Marine Biological Observatory are unable to identify the creature from the fishermen’s description.’ Yet these same ‘experts’ assure us that the paragraph is a case of ‘leg-pulling.’

#### BRITISH FLOWERING PLANTS.

The British Museum (Natural History) is issuing a series of coloured postcards, in packets of five, illustrating British Flowering Plants, together with interesting descriptions. Several of these deal with Orchids and other more interesting species. From the letterpress given with each, we gather that: ‘The native British Flora contains almost 2000 species of flowering plants belonging to just over 500 Genera and 90 Families. The largest families are the Compositæ and the Gramineæ (Grasses). The present flora of the lowlands is very artificial, being much affected by cultivation. In the south the natural vegetation would be mainly deciduous-leaved forest, and in former times forests were widespread, the great Wealdon Forest being almost impenetrable. Where the rainfall was insufficient to support forest, grassland and heaths flourished: nowhere are we far enough away from the effects of the ocean to produce a desert, and the driest areas are the East Anglian sandy heaths. The great mass of the flora is similar to the flora of Central and Western Europe. There is also what is termed a “Western element” which is most abundant in the west of these islands, sometimes occurring only in a few isolated localities in the extreme

south-west of England or west of Ireland; the species comprising this element are found in the west of France and Portugal, sometimes also in west Europe generally and in the Mediterranean region. This element is possibly a relict of the Preglacial flora. In East Anglia are a few species forming a "Steppe-element"; so called since they occur mainly in the Steppe-regions of Russia, reaching us across the sands of the north German plain. Our Arctic-alpine plants are rare, some forming a "Scandinavian element" only occurring besides in the Scandinavian mountains and sub-polar regions. Our few Arctic-alpines are becoming rarer owing to extirpation by collectors and others. Some ledges rich in rarities twenty years ago have now none left. Rare plants should not be picked except for special reasons; they should be investigated and left to seed. Wildflower competitions in which children are told that they must actually pick a flower before they add it to their list are much to be deprecated.

THE PLANKTON OF A HERRING GROUND.\*

With the above heading R. E. Savage gives an interesting report well worthy of consideration by those interested in the Fishing Industry. He concludes: 'The Decapod larvae for the whole cruise are analysed. They were most abundant off the Yorkshire and Lincolnshire coast, and with the exception of *Portunus* were in the lower layers of water. The proportions of the constituent species in the plankton from the fishing ground were very similar to those given by Hardy for herring food. Hardy showed that during July copepoda made up the greatest part of the food, and it would appear that the number of herring which this ground could support would be limited by the quantity of copepoda present. This quantity was not large at the time of the cruise, and, in consequence, it seems that the ground could not maintain herring in sufficient numbers to make fishing profitable. (During the period in question drifters were only catching from  $\frac{1}{2}$  to  $1\frac{1}{2}$  crans per night's fishing.) It is conceivable, too, that owing to the restricted diurnal migration of the plankton, such herring as were on the ground did not rise sufficiently high in the water to be captured by the nets. An effort was made to locate a richer plankton region by working a line of stations eastward from the fishing zone, but it was found that the plankton changed from a rich red colour to pink, and finally almost white, while the quantity decreased. *Temora* was still the predominant species, and the proportions of other species were much the same as on the fishing ground, so that the change of colour was not due to an alteration in composition.'

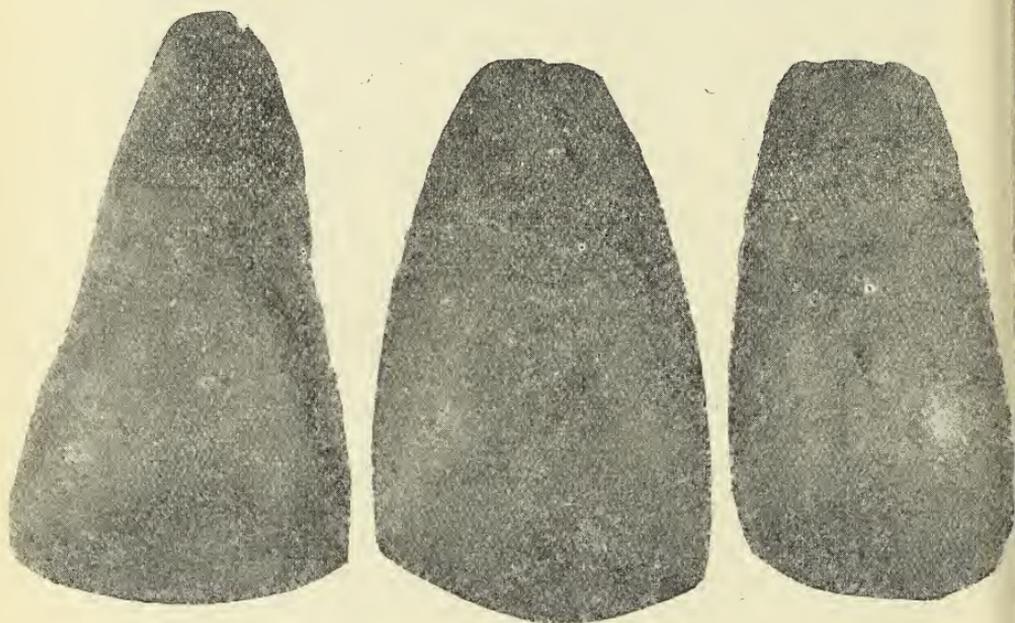
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\* 'Ministry of Agriculture and Fisheries Fishing Investigations,' Series II., Vol. IX., No. 1, 36 pp., 5/-.

## HOARD OF NEOLITHIC AXES IN EAST YORKS.

T. SHEPPARD, M.SC., F.G.S.

FROM time to time in the east of Yorkshire announcements have been made of the discoveries of hoards of bronze axes, and at Skirlaugh, Sproatley, Everthorpe, Scarborough, Leppington, Hotham, and other places, founders' hoards of bronze implements have been discovered, a few of which are in the British Museum, London, but most are in the



Front view.

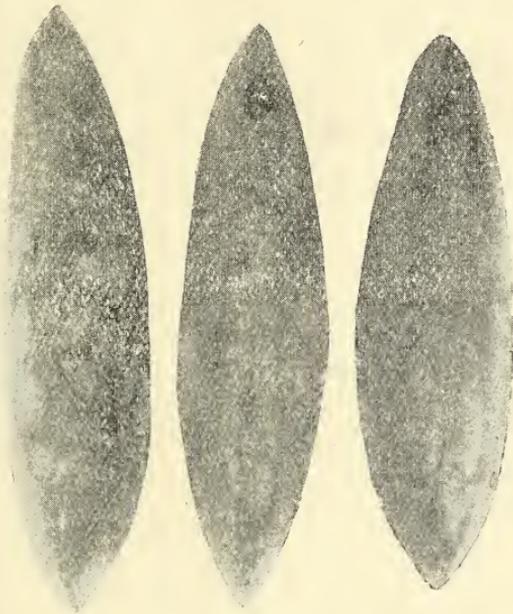
museum at Hull. In these cases the Bronze Age trader, for some reason or other, had hidden or lost his wares, which consisted of moulds for casting the bronze axes, the bronze axes themselves, and in some cases broken bronze implements, or ingots, evidently ready for the melting pot. Sometimes as many as fifty or sixty of these implements have been found together, representing about as much as a traveller could conveniently carry.

It rarely happens, however, that collections of implements of the Stone Age occur, which have clearly been the work of one man, and have been left deposited together, either by accident or for some other reason of which no evidence exists. Such a find, however, has recently been made at Cottingham. From an archæological point of view it is interesting, as Cottingham has not yielded any great evidence

of Prehistoric Man. The Hull Museum possesses a remarkably fine dagger of flint of a type similar to those found in the barrows on the Yorkshire Wolds, which always accompany an interment, probably some nine or ten examples being in the Mortimer collection, but this is attributable to the Bronze Age.

At Cottingham, many years ago, also, four very fine solid gold armlets were discovered in a field at the side of the railway, and eventually found their way to the British Museum, which is kindly supplying facsimiles for the Hull Museum.

On the road leading from Cottingham northward, parallel with the railway line, the Hull Corporation is at present



Side view.

excavating gravel, and an interesting section of late glacial gravels with the characteristic derived chalk and other fossils is available. This has been visited on a number of occasions by Hull geologists, and the workmen and others have been advised to keep a look-out for any interesting finds. Recently Mr. T. Wright obtained three quite typical Yorkshire Neolithic stone axes, which are so much alike as to suggest that they are the workmanship of one man, and they were found together during the excavations of the gravel. They had either been purposely buried or accidentally lost, probably enclosed in some covering, as they have clearly not been used, but are sharpened ready for barter or exchange. Each of the three is made of the fine-grained volcanic ash known

as Borrowdale Ash, which occurs in the Lake District, and from which so many of the Prehistoric axes of the Stone Age found on the Yorkshire and Lincolnshire Wolds have been made.

This material was certainly quarried near the Lake District for the purpose of the manufacture of axe-heads, as it is comparatively easily ground down, and can be made to acquire an exceedingly sharp cutting edge. Two of the three Cottingham axes are so alike in texture that they might have been derived from the same piece of stone. Of course these Lake District rocks were deposited all over Yorkshire by the glaciers during the Great Ice Age, so that it is not always possible to be certain whether the axes were from the rock actually excavated in the Lake District, or from derived boulders obtained in the Drift. The sharpness of the cutting edges, the similarity of the curious way in which the sides of the implements are finished off, and the formation of the axes themselves, are all remarkably suggestive.

The longest weapon is evidently made from an axe which originally was much larger, but on being broken has been chipped laterally and re-sharpened so as to be in keeping with the other two new examples (by 'new' we mean that they have been prepared ready for barter, but obviously have never been used). The accompanying photographs show the three axes, both front and side views, the latter being very similar. They measure  $4\frac{1}{2}$  in., 4 in., and 4 in. in length respectively, each is about an inch thick at the widest part, the cutting edges being  $2\frac{1}{2}$  in.,  $2\frac{1}{2}$  in., and  $1\frac{3}{4}$  in. in length. They weigh 7 oz., 8 oz., and  $6\frac{1}{2}$  oz. respectively.

The Hull Museum contains a large number of interesting axes found in different parts of the East Riding and North Lincolnshire, and in addition has the wonderful collection formed by the late J. R. Mortimer, which was purchased by Colonel Clarke for the Corporation, and is now being prepared ready for public exhibition; but in practically every instance the finds have been isolated. Many of the axes, admittedly are larger and better made than the present three, but the specimens now described have an interest as they clearly indicate trading in these parts in Neolithic times.

Our thanks are due to Mr. Wright for taking care of the specimens, and handing them over to the museum.

—: o :—

**Field Vole at Great Height in Yorks.**—On August 1st, 1926, I caught a Field Vole (*Arvicola agrestis*) on Swarth Fell, Mallerstang, Yorks., N.R., at an altitude of 2200 feet. I have not previously seen this animal except in the lowlands.  
—V. C. WYNNE EDWARDS.

## NOTES ON YORKSHIRE AMMONITES.

DR. L. F. SPATH.

### IX.—ON RECENT CRITICISMS.

In the concluding paragraph of our last note reference was made to a paper by W. Lange, just received, in which he discussed a number of the genera created by the writer. He classed them in a modified scheme with, for example, *Euagassiceras* excluded from Agassiceratidæ, which I thought could not pass unchallenged. Lange complained, with some justification, that the genera were scattered in a number of papers, and that there was not anywhere a systematic tabulation facilitating quick orientation. Since the list he gave was incomplete and since, apparently, Lange had not seen any of the previous articles of the present series in which many of the genera have been discussed, I at first considered it advisable to publish a revised and completed classificatory scheme of the Ammonites of the Hettangian and Sinemurian. Being well represented on the Yorkshire Coast, the ammonites of these systems were thought to be of interest to readers of *The Naturalist*, and a tabular list of the new genera of use to Yorkshire geologists.

On reconsideration, however, it does not seem worth while dwelling on these classificatory squabbles, for nomenclature will right itself in time. Moreover, it is hoped that after completion of the Catalogue of Triassic Ammonoidea in the British Museum, it will be possible to deal in detail with the Lias ammonites. So it is proposed to discuss in the present instalment only a few general points of ammonite nomenclature suggested by Lange's criticisms.

This author also complained that the genera were often based merely on a genotype, that they were not defined in detail, and that their limits with regard to other genera had not been fixed. It should be mentioned, first of all, that new names are generally given because they are wanted. There are forms that cannot be included in any existing genus such as the unique Ectocentritids described by Bonarelli,<sup>1</sup> of which the British Museum (Natural History) is fortunate enough to possess the holotypes. The writer holds that these astonishingly diverse, but, unfortunately, very rare forms are important links between the fundamental Lytoceratids and their trachyostracous offshoots, and has accordingly characterised them by separate generic designations. But generally new names are quickly adopted, not only by the

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<sup>1</sup> 'Cefalopod. Sinemur. dell' Apennin. Centr.' *Pal. Ital.*, Vol. V. (1900).

systematist and curator, but also by the stratigrapher. Many of Hyatt's undefined genera of 1900<sup>1</sup> are now universally used simply because workers on ammonites felt the need for them; and elasticity in a 'natural' classification is not a disadvantage.

By characterising *Tragophylloceras* as a group of forms ranging themselves round the genotype species, *T. numismale* (= *Ammonites heterophyllus numismalis* Quenstedt) Hyatt created a useful systematic unit, without 'giving trouble' to any of his followers. If it be found at a later date that, for example, *Tragophylloceras ibex* (Quenstedt) had best be excluded from this genus, the incorporation of its special features in a formal diagnosis of *Tragophylloceras* would not have helped Hyatt's successors. Those who hope to be able to identify ammonites nowadays by means of a simple 'key,' or who object to using a genus because they are 'put to the trouble of working out the *differentia specifica*,' i.e., making themselves acquainted with the forms belonging to it, had better confine their attention to other objects. The specialist knows at once what is meant by the 'group of *Psiloceras laqueus*' or the 'group of *P. megastoma*,' and need not read the diagnosis which, on the other hand, would only mislead the beginner. The introduction of new generic or sub-generic names thus requires mere cataloguing. It seems curious, by the way, in view of his sarcastic remarks about new names for Waehner's types, that Lange should propose sub-generic separation of these two groups.

It may be recalled in this connexion that E. Fossa Mancini<sup>2</sup> in 1915 wrote that a just conception of a genus may be obtained by an examination of the forms that are closely allied to the genotype rather than by a diagnosis; and he referred to R. Douvillé's<sup>3</sup> similar remarks in connexion with the definition of a family. But to those who are not familiar with the whole tribe of Ammonoidea the examination of the genotype or of all the known species of a given limited division may prove disappointing; and the most glaring mis-identifications of, e.g., Cretaceous ammonites have been made by workers conversant only with, say, Jurassic forms.

The families Phylloceratidæ and Lytoceratidæ are being dealt with in detail in the first part of the writer's forthcoming 'Revision of the Jurassic Cephalopoda of Kachh' (*Mem. Geol. Surv. India, Pal. Indica*), the former also in the British

<sup>1</sup> In Zittel's 'Test Book of Palæontology' (Transl. Eastman), first ed., Vol. I.

<sup>2</sup> 'Osservaz. Crit. s. *Hammatoceras*.' *Proc. Verb. Soc. Tosc. Sci. Nat.*, Vol. XXIII., p. 8.

<sup>3</sup> 'Esquisse Classif. Phylogen. Oppedidés.' *Bull. Soc. Géol. France*, sér. 4, Vol. xiii. (1913), p. 57.

Museum Catalogue of Fossil Cephalopoda (Vol. IV.) now in preparation, where the connexion of Phylloceratida with the Triassic Monophyllitids is discussed. Apart from Ectocentritidæ, which include the genera listed by Lange as Lytoceratids, there remain then only the genera of the three great Lower Liassic super-families, Psiloceratida, Ammonitida and Deroceratida. Time will show which of these genera are necessary or justifiable, but a simplification of nomenclature is not possible in the present state of our knowledge. We need only recall how polyphyletic an assemblage turned out to be for example the Deroceratida.

Another difficulty that presents itself immediately one thinks of compiling a list is the uncertainty about the genotypes. To take only the first genus of the first of the three Lower Liassic families above-mentioned, Dr. Lange gives as genotype of *Psiloceras* Quenstedt's *Amm. psilonotus levis*, doubtfully identified with Sowerby's *Amm. planorbis*. Mr. Buckman<sup>1</sup> considered that the genotype was definitely fixed by the name *Psiloceras psilonotum*. Now this is a new principle, and if admitted, or applied retrospectively, would mean an immediate change in many of our genotypes. Mr. Buckman states that 'the genotype of *Psiloceras* is nearly always incorrectly given as *P. planorbis*.' He listed it himself in 1898<sup>2</sup> as the only species of *Psiloceras* in a table of generic names ranging from the Liassic *Amaltheus* to the Inferior Oolite *Stepheoceras*. Let us note at once that the genotype of the former genus is not 'fixed by the name,' *i.e.*, is not *Amaltheus amaltheus*, that of *Stepheoceras* is not *S. coronatum*, even in much later papers of the same author.

Mr. Buckman's table of 1898 was headed: 'Opposite the generic names are placed the names of certain illustrative species. In most cases the name which stands first may be considered as the type species.' Why was this second sentence added if, as he now maintains, the first expressed all he intended to say? So far as the types were not ruled out by previous selections, notably Fischer's<sup>3</sup> scheme, I considered them binding; but I am willing to accept the opinion of authorities on zoological nomenclature. Elsewhere Fischer<sup>4</sup> recorded the genus *Harpoceras* 'qui a pour type l'*Amm. serpentinus* Schlotheim.' Surely nothing can be more definite than this; and if the type is recognisable it must stand as the genotype of *Harpoceras*.

<sup>1</sup> 'Type Ammonites.' V., 1924, p. 34.

<sup>2</sup> 'The Grouping of some Divisions of so-called "Jurassic" Time.' *Quart. Journ. Geol. Soc.*, Vol. LIV. (1898), p. 461.

<sup>3</sup> 'Sub-divisions des Ammonites.' *Journ. Conchyliol.*, Juillet, 1879, pp. 1-45.

<sup>4</sup> 'Manuel de Conchyliologie,' 1882, p. 392.

The Yorkshire *Psiloceras erugatum* is intercalated by Mr. Buckman as a zonal index, between the hemeræ of (the Watchet) *P. planorbis* and *P. æquabile* below and (the Wurtemberg) *P. plicatus* and *P. psilonotus* above. There is not the slightest evidence for this five-fold sub-division of the *planorbis* 'zone,' but Mr. Buckman disarms criticism by expressly stating that the use of two or more names instead of one is not to be taken as a positive assertion that there are two or three anisochronous hemeræ instead of one. Since Mr. Buckman has done such excellent work in showing how the principle of William Smith can be applied in far greater detail than was commonly supposed, it seems unfortunate that he is now spoiling his case by over-statement. And considering how speculative his table of hemeræ is known to be, what are we to think of his inversion of the three horizons: *rehmanni*, *anceps*, and *fraasi*, in his Reineckeian age, a sequence well proved in the field? I may be permitted to protest since I am responsible for sub-dividing for example the Gault into sixteen horizons, based on years of zonal collecting. Mr. Buckman quotes the small thickness of the Gault in support of his methods in an 'Appreciation,'<sup>1</sup> but our tables were scarcely comparable and I am anxious lest ammonite zones become anathema to the general geologist.

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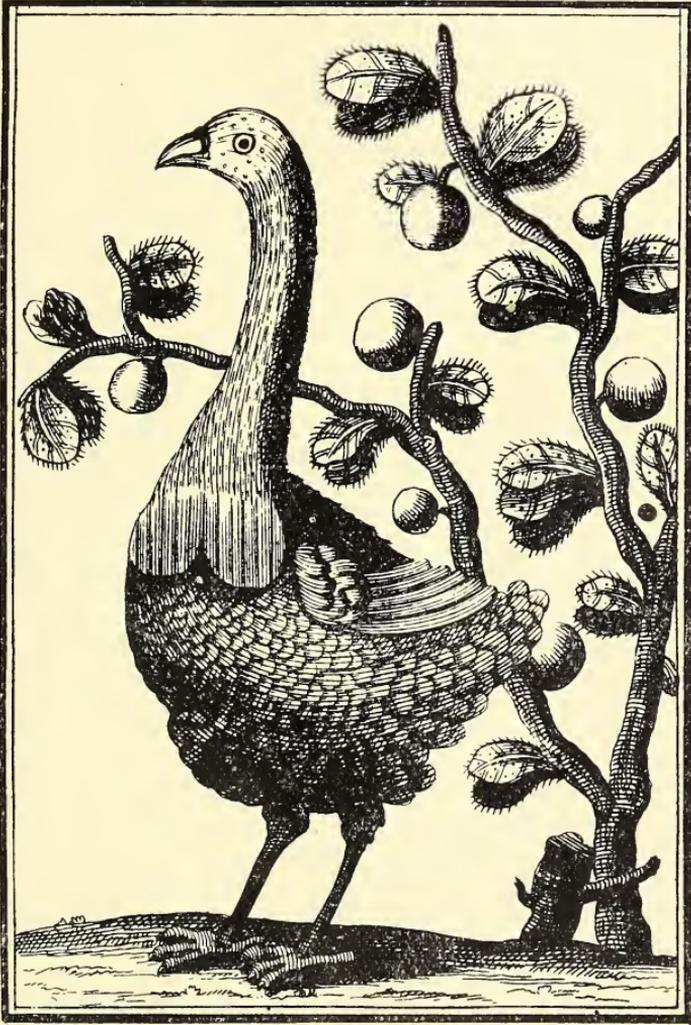
**Mason Wasp Cells in Lock.**—About a year ago the City Engineer sent to the Hull Museum a lock which had been put out of action as the spaces inside had been occupied by the mud cells of a Mason Wasp (*Odynerus pictus* Curtis). The lock was treated with cyanide, but in the hot weather during July the wasps hatched out and were seen moving about in the case. I am indebted to Mr. A. E. Bradley for identifying the species.—T. SHEPPARD.

**Remains of *Bos primigenius* at Paull, East Yorks.**—Through the good offices of Mr. F. H. Allen, of Scale Lane, a massive bone has been presented to the Museum at Hull. It was dug up while excavating for gravel at Paull. It is portion of the frontal of *Bos primigenius*, an extinct species of Buffalo. Attached to the skull is a section of the horn core, which measures a foot in girth. Upon this, of course, the horn itself was originally fixed. While remains of this species have been recorded for Burstwick and Kelsey Hill, this is the first record for Paull, where, hitherto, mammalian remains have been very scarce, possibly because previously the gravel had not been excavated to any great depth.—T. SHEPPARD.

## RARE NATURAL HISTORY VOLUME.

T. SHEPPARD, M.SC., F.G.S.

AN interesting addition has been made to the Natural History Museum, Albion Street, in the form of a rare work entitled



'Voyages and Adventures of Francois Leguat,' which was published at Leipzig in 1709, and has a fine engraved frontispiece. Its value from a naturalist's point of view lies in the fact that it contains the original description and illustration of the Solitaire, an extinct bird from Rodriguez, near Mauritius.

The species is quaintly referred to in the works issued by the Hakluyt Society as under: 'Of all the Birds in the

Island, the most Remarkable is that which goes by the Name of the *Solitary*, because 'tis very seldom seen in Company, tho' there are abundance of them. The Feathers of the Males are of a brown, grey Colour : the Feet and Beak are like a Turkeys, but a little more crooked. They have scarce any Tail, but their Hind-part cover'd with Feathers is Roundish, like the Crupper of a Horse, they are taller than Turkeys. Their Neck is straight, and a little longer in proportion than a Turkeys, when it lifts up his Head. Its Eye is black and lively, and its Head without Comb or Cop. They never fly, their Wings are too little to support the weight of their Bodies ; they serve only to beat themselves, and flutter when they call one another. They will whirl about for twenty or thirty times together on the same side, during the space of four or five Minutes : The Motions of their Wings makes then a noise very like that of a Rattle ; and one may hear it two hundred Paces off. The Bone of their Wing grows greater towards the Extremity, and forms a little round Mass under the Feathers, as big as a Musket Ball : That and its Beak are the chief Defence of this Bird. 'Tis very hard to catch it in the Woods, but easie in open Places, because we run faster than they, and sometimes we approach them without much Trouble. From March to September they are extremely fat and tast admirably well, especially while they are young, some of the Males weigh forty-five pounds. The Females are wonderfully beautiful, some fair, some brown ; I call them fair, because they are of the colour of fair Hair : They have a sort of Peak like a Widow's cap upon their Breasts, which is of a dun Colour. No one Feather is stragling from the other all over their Bodies, they being very careful to adjust themselves, and make them all even with their Beaks. The Feathers on their Thighs are round like shells at the end, and being there very thick, have an agreeable effect : They have two Risings on their Craws, and the Feathers are whiter there than the rest, which livelily Represents the fine Neck of a Beautiful Woman. They walk with so much Stateliness and good Grace, that one cannot help admiring and loving them ; by which means their Mein (*i.e.*, *mien*) often saves their lives.

' Tho' these Birds will sometimes very familiarly come up near enough to one, when we do not run after them, yet they will never grow Tame : As soon as they are caught they shed Tears without Crying, and (obstinately) refuse all manner of Sustenance till they die.'

The same volume contains a skeleton of Leguat's Solitaire. Pezophaps, Solitaria, since discovered, which is in the Museum of Zoology at Cambridge.

The volume is the gift of Mr. Hans Schlesch.

## YORKSHIRE COLEOPTERA, 1925-1926.

M. LAWSON THOMPSON, F.E.S.

*(Continued from page 256).*

- Epuræa melina* Er. Forge Valley, 1923. G.B.W.  
*E. pusilla* Ill. Raincliffe Wood, 1923. G.B.W.  
 \**Micrurula melanocephala* Marsh. Duncombe Park, Helmsley, May, 1923 (M.L.T.); Arncliffe Wood, Glaisdale, on bird cherry, common in May, 1925 (G.B.W.).  
 \**Meligethes rubripes* Muls. Skipwith Common, 1923 (G.B.W.); also in Raincliffe Wood, 1925 (G.B.W.).  
*Rhizophagus depressus* F. Raincliffe Wood, 1923. G.B.W.  
*Monotoma longicollis* Gyll. Thornton Dale, 1923. G.B.W.  
 \**Cryptophagus scutellatus* Mewm. (*bicolor* Sturm). Blackmoor, near Leeds, 1924. W.D.H.  
*Cryptophagus distinguendus* Sturm. Harewood, Leeds, 1923. W.D.H.  
*C. badius* Sturm. Scarborough, in a pigeon cote, 1925. G.B.W.  
 \**C. acutangulus* Gyll. Leeds, 1924. W.D.H.  
*C. setulosus* Sturm. Richmond, 1923. G.B.W.  
*Antherophagus nigricornis* F. Forge Valley, 1923. G.B.W.  
*A. pallens* Gyll. Ellerbeck and Goathland, 1923 (G.B.W.); Askham Bog, 1925 (M.L.T.).  
 †*Atomaria linearis* Steph. Sherburn and Forge Valley, near Scarborough, 1925. G.B.W.  
*Cartodere ruficollis* Marsh. West Ayton, nr. Scarborough, 1923. G.B.W.  
*Corticaria impressa* Oliv. (*denticulata* Gyll.). Bridlington, 1923, and Skipwith Common, 1925 (G.B.W.); Leeds (W.D.H.).  
*C. serrata* Payk. Scalby, 1923. G.B.W.  
 †*C. ferruginea* Marsh. (*fenestralis* Brit. Cat.). Sawdon Dale, near Scarborough, 1925. G.B.W.  
*Litargus connexus* Geoff. (*bifasciatus* F.). Harehills, Leeds, 1923. W.D.H.  
*Cerylon histerooides* F. Harewood, Leeds, 1923 (W.D.H.); Eccup, near Leeds (J.R.D.).  
 †*Sphærosoma (Alexia) piliferum* Müll. Wharnccliffe, one specimen, June, 1924. E.G.B.  
 \**Anisosticta 19-punctata* L. Askham Bog, June, 1925. M.L.T.  
*Hyperaspis reppensis* Hbst. Near Cloughton, 1923. G.B.W.  
 \**Heterocerus fenestratus* Thun. (*levigatus* Panz.). Hedon, September, 1923. T.S.  
*Aphodius granarius* L. Harwood Dale, near Scarboro', 1923. G.B.W.  
*Phyllophthera horticola* L. Everingham, 1924. H. Maxwell-Stuart.  
*Corymbites æneus* L. Weeton, 1922. J.R.D.  
*Melanotus rufipes* Hbst. Blackmoor, near Leeds, 1924. W.D.H.  
*Limonius minutus* L. Skipwith Common, June, 1923. W.J.F.  
*Cyphon padi* L. Gormire, 1923 (T.B.K.); Askham Bog, June, 1925 (M.L.T.).  
*Platycis minutus* F. Mulgrave Woods, Sandsend, August, 1925, two specimens. J.M.B.  
*Cantharis abdominalis* Fab. var. *cyanea* Curt. Near Blubberhouses, June, 1923 (A.E.W.); Ramsdale Wood, Robin Hood's Bay, June, 1924 (M.L.T.).  
*Malthodes misellus* Riss. Forge Valley, 1925. G.B.W.  
 \**M. atomus* Th. Poole, July, 1925. W.D.H. and J.R.D.  
*Malachius bipustulatus* L. Skipwith and Allerthorpe Common, June, 1923. W.J.F.  
*Dasytes ærosus* Kies. Rycroft Glen, 1923. J.M.B.  
*Ptinus tectus* Boield. Sheffield, 1923 (J.M.B.); nr. Yarm, 1923 (M.L.T.).

- Hedobia imperialis* L. Askham Bog, June, 1925; Leathley, near Poole, 1922. W.D.H.
- Priobium excavatum* Kng. (*castaneum* Brit. Cat.). Forge Valley, 1925 G.B.W.
- † *Ernobius nigrinus* Sturm. On a wind-felled pine on Cloughton Bank. Two specimens on July 11th, 1925. G.B.W. A local insect in the Highlands of Scotland, but not previously recorded south of the border.
- Ptilinus pectinicornis* L. Seacroft, near Leeds, 1925. W.D.H. and J.R.D.
- Stenochorus (Toxotus) meridianus* L. Near Leeds, 1924. T.B.K.
- † *Tetropium gabrieli* Weise. var. *crawshayi* Shp. Several specimens imported into Barnsley with larch planks from near Oxford, June, 1924 (E.G.B.); also one imported into Middlesbrough, 1925 (M.L.T.).
- Anaglyptus mysticus* L. Everingham, 1923. H. Maxwell Stuart.
- Leiopus nebulosus* L. Ecclesall Wood, near Sheffield, 1923 (J.M.B.); Everingham, 1923 (H. Maxwell-Stuart).
- Saperda populnea* L. Everingham, 1923 (H. Maxwell-Stuart); Blackmoor, near Leeds (W.D.H.).
- Monohammus sartor* F. Leeds (an importation), 1925. J.R.D.
- Lema cyanella* L. ab. *obscura* Steph. Fyling Hall, 1925. G.B.W.
- Cryptocephalus fulvus* Goetz. Allerthorpe Common, August, 1923. W.J.F.
- Galerucella lineola* F. Askham Bog, York, June, 1925. M.L.T.
- Galeruca (Adimonia) tanacetii* L. Common on Allerthorpe Common, Sept., 1923. W.J.F. A very interesting note on this species by Dr. Fordham appeared in *The Naturalist*, 1924, pp. 309-321.
- Haltica oleracea* L. Pickering, 1923 (G.B.W.); Allerthorpe Common, 1923 (T.B.K.).
- Phylloiveta atra* Payk. Duncombe Park, Helmsley, May, 1923. M.L.T.
- † *Longitarsus holsaticus* L. Near Cloughton, one specimen by sweeping, August, 1922. W.J.F.
- \* *L. exoletus* L. East Ayton, near Scarborough, 1925. G.B.W.
- L. succineus* Ford. (*laevis* All.). Hayburn Wyke and Cayton Bay, 1925. G.B.W.
- L. pratensis* Panz. (*pusillus* Gyll.). Leeds, 1922. W.D.H.
- \* *Phytonomus (Hypera) fasciculatus* Hbst. On the coast at Redcar under *Erodium*, September, 1923. R. S. Bagnall.
- \* *Notaris (Eirrhinus) aethiops* F. Sherburn, near Scarborough, one specimen in flood refuse, June, 1925. G.B.W.
- † *Pentarthrum huttoni* Woll. Near Leeds, one specimen, June, 1923. J.R.D.
- Rhinoncus pericarpus* L. Ecclesall Wood, near Sheffield, 1923. J.M.B.
- \* *R. castor* F. Allerthorpe Common, 1925. G.B.W.
- † *Ceuthorrhynchus asperifoliarum* Gyll. On *Myosotis* in Duncombe Park, Helmsley, May, 1923. M.L.T.
- \* *Orobitis cyaneus* L. Allerthorpe Common, one specimen in a sandpit, June, 1923. W.J.F.
- \* *Balanobius (Balaninus pars) pyrrhoceras* Marsh. Forge Valley, 1925. G.B.W.
- Miccotrogus picirostris* F. Hook Moor, near Leeds, 1924. W.D.H.
- \* *Orchestes foliorum* Müll. (*saliceti* Fab.). Near Middleton-in-Teesdale, on sallow, June, 1925. W.J.F.
- \* *Gymnetron pascuorum* Gyll. Near Selby, June, 1923. M.L.T.
- Rhynchites pubescens* F. Bilton Wood, Harrogate, July, 1923. A.E.W.
- \* *Anaspis subtestacea* Steph. Forge Valley and Richmond, 1923. G.B.W.
- A. geoffroyi* Müll. Forge Valley, 1923. G.B.W.
- Hallomenus binotatus* Quens. (*humeralis* Panz.). Leeds, 1923. J.R.D.
- Gonodera (Cistela) murina* L. Hayburn Wyke, 1923. G.B.W.

## AN ABNORMAL SPECIMEN OF *CARDAMINE PRATENSIS* L.

JAMES M. BROWN, B.SC., F.L.S., F.E.S.

WHILE collecting on the lower slopes of the Coniston Old Man, in the Lake District, during May last, I saw a plant of *Cardamine pratensis* of larger size, and having more deeply coloured flowers, than usual. The plant was growing in a very damp situation, was about eighteen inches in height, and bore three clusters of flowers of a deep lilac colour. The terminal raceme carried a good series of flowers, some unopened, some well expanded, and others faded, the upper lateral raceme had five opened and several unopened flowers, while the lowest lateral cluster had three flowers only. When examined, all the flowers, without exception, were found to be abnormal as regards the gynæceum, but otherwise quite typical.

The abnormality\* took one of two forms. In some cases a stalked bud-like structure occupied the centre of the flower, in place of the usual gynæceum. The envelope of this bud consisted of a variable number of foliar organs, the inner ones occasionally having lilac coloured tips, and enclosed a number of malformed and irregularly shaped leaf-like structures bearing anther-lobes, but no sign of a pistil. These are probably peculiar examples of proliferation.

In the remainder of the flowers the centre was occupied by a gynophore, equal in length to the claws of the petals, bearing a pear-shaped structure having the usual external features of the pistil—such as the marginal sutures marking the position where the edges of the two carpels meet—and terminating in a stigma which in some cases was bilobed. This 'ovary,' however, contained, not the usual ovules, but an irregular cluster of malformed stamens. In one example only the 'ovary' contained six fairly perfect stamens and a central body bearing some resemblance to a pistil.

In the withered flowers the 'ovary' had enlarged to form a 'fruit,' slightly purplish in colour, with the external features of a siliqua, but shaped like an inverted pear borne on a fairly long stalk. This contained no suggestion of seeds, but enclosed the same confused mass of malformed stamens, *i.e.*, leaf-like structures bearing anther-lobes.

It is remarkable that the structures occupying the position of the pistil should in every case contain, as the most recognisable organs, partially formed stamens. More peculiar

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\* This abnormality is similar to the one described by Miss E. R. Saunders in the Wallflower. In this case corolla, stamens and ovary were formed inside the original ovary. Miss Saunders has also seen the same thing in *Mecanopsis cambrica*.—Ed.

still is the fact that in old and faded flowers the ovary should have enlarged, as if pollination and fertilisation had normally occurred, and produced a fruit-like body, which, though not of normal shape, and having unusual contents, could easily have been mistaken for a siliqua. This is presumably an example of parthenocarpy, such as occurs in some members of the Rosaceæ.

It is obvious that the structures found inside the ovary had not developed from ovule rudiments, as they did not occupy the normal position of ovules on the placentas. This agrees with the case quoted long ago by Masters ('Pflanzen Teratologie,' German Edition, 1886, p. 211) from Bromfield's 'Flora Vectensis,' in which several of the lower ovaries of a plant of *Cardamine pratensis* had developed within them bud-like bodies, the buds in this case containing, in addition to the floral leaves, rudiments of stamens and pistils with ovules. In this plant, however, several buds developed *within one* ovary, while in the specimen described now a single bud was formed in place of the normal ovary. As Worsdell, in his more recent work ('Principles of Plant Teratology,' Vol. II., 1916, p. 267), re-quotes the same example from Masters' volume, it seems evident that this type of malformation is not at all common in *Cardamine*. Other cases are well known of adventive flowers and fruit occurring within ovaries, but arising by the substitution of flower buds for the normal ovules.

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## CORRESPONDENCE.

### THE JUNIPER ASSOCIATION OF UPPER TEESDALE.

On the occasion of the visit of the Yorkshire Naturalists' Union to Upper Teesdale (Whitsuntide, 1925), much was said about the Juniper Thicket—which is so abundant on the whin sill—as to whether it is progressive or retrogressive. In the circular Dr. T. W. Woodhead says, speaking of the juniper on the cliffs of Falcon Clints, 'Here its development is doubtless favoured by the precipitous basaltic cliffs, which preserve it, to a great extent, from the degredations of sheep, here, too, heather is rarely burnt.'

The conclusion arrived at at the Teesdale meeting was that this theory was not correct, and that sheep do not eat the juniper. It was also thought that the juniper was retrogressive, because dying and dead junipers were not infrequent, seedlings and young trees were very rare, and many prostrate and moribund bushes were surrounded closely by vigorous ling, and that the probable cause of its retrogression was that it was being pushed out by the invasion of ling on a soil steadily becoming more acid.

This theory, in my opinion, is not correct, as there is no evidence to show that the ling is pushing out the juniper, for it will flourish equally well on either an acid or an alkaline soil.

A short time after the meeting a letter was received from Mrs. Arnott, of the Forest School, saying that it was a recognised fact amongst

the people of the district that sheep do not eat the juniper under any circumstances, and rabbits will only do so under exceptional conditions of food shortage, when they will then nibble the bark. It also mentioned that many trees had been rooted up by the inhabitants for fuel.

For many years now I have worked among sheep, and have some idea about what they will and will not eat.

In spite of what the inhabitants of Upper Teesdale think, I am convinced that sheep will, and do, eat the juniper, *but* only the very tiny seedlings, or, in extreme food shortage, they will probably nibble the very tender shoots of older trees in spring. Rabbits will only nibble the bark in very hard weather in winter, and any damage they do is very slight as regards having any effect on its retrogression. Therefore, the three points made by Mr. A. M. Smith (*The Naturalist*, No. 822, p. 215) may be explained as follows:—

Seedlings and young trees very rare; because the sheep will nibble all or nearly all off, along with the grass, when the seedlings just begin to shoot, so they are seldom allowed to grow big enough to be noticeable.

Dying and dead junipers are not infrequent; because, seeing that the seedlings are destroyed, nothing but older trees are left, and some die a natural death, while others are killed by rabbits ring-barking the trees in hard weather.

Prostrate and moribund bushes closely surrounded by vigorous ling; these trees either naturally in a half dead condition, or half killed by rabbits, give the ling a better chance of pushing around them, whereas, when the trees are young and vigorous it has no chance of doing so, and with few young trees growing to take the place of the old ones a bigger percentage of these is seen.

The frequency of the juniper on open ground, as well as on the cliffs, does not prove in any way that sheep do not touch it. On the cliffs, of course, in many places they cannot eat all the seedlings, but as open ground is pastured differently in various places in one district, the seedlings get a better chance in some places than others.

I think the people of Teesdale, in speaking of the sheep never eating juniper, allude to the older trees and bushes, and overlook the fact that there are tiny seedlings almost unnoticeable, which play a large part in the continuance of its kind.

From the foregoing we can conclude that the juniper thicket in Upper Teesdale, if out of the way of sheep, is still holding its own in the association, and is probably neither progressive nor retrogressive. Also, in relation to the number of trees, they are just throwing forth as many seeds which germinate as ever. If the juniper is retrogressive in Teesdale, it is only so in certain areas, and there it is not due to any natural change of soil or pushing out by other plants, but to the over-stocking of sheep on these areas by man.—J. N. FRANKLAND.

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**The Families of Flowering Plants—I. Dicotyledons**, by J. Hutchinson. London: Macmillan, pp. xi.+328, 20/- net. This work, by a member of the staff of the Royal Gardens, Kew, is appropriately dedicated to George Bentham and Joseph Dalton Hooker, and aims at meeting the need for a small handbook on the subject. The earlier pages are devoted to an artificial analytical key to these families, and it is thought that by the use of this key and a pocket lens it should be possible for an intelligent person with only a slight knowledge of botany to allocate to their families most of the plants which he may meet with in any part of the world. The remainder of the book is devoted to descriptions of the families of Dicotyledons, arranged according to a new system based on their probable phylogeny. In this he dissents from the views expressed by Engler and Prantl, and returns

to the position adopted by Bentham and Hooker in the *Genera Plantarum*, and regards the Ranales on the one hand, and the Magnoliales on the other, as the starting points of his phylogenetic arrangement. He also divides the families into two groups according to their tendency to be herbaceous or arborescent. While some of his grouping will rather startle many systematists, they will agree that on the whole the attempt is an admirable one, and whether accepted or not, all will be grateful for the wealth of figures and distribution maps, by the author and Mr. W. E. Trevithick, with which the work is illustrated. An appreciative foreword is written by Mr. A. W. Hill, Director of Kew Gardens.

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### JURASSIC AMMONITES.

It is refreshing to read a memoir on ammonites written in plain English. Of late, those who consult literature on ammonites published in this country are accustomed to works of a different sort. Such literature often takes the form of 'pemmican.' Certainly it provides material for mental excursions into many lands, but its bulk is reduced to a minimum. If any text is forthcoming at all (and the rules of nomenclature can insist on nothing beyond a name, provided that an adequate figure is either given or cited) it is freely interspersed with new names in clarendon type. A page of such text has the appearance of being sprinkled with thick-faced type, as from a pepper-box. Our hopes are revived therefore, when we turn to the latest memoir on ammonites,\* for not only do we find adequate verbal diagnoses of most of the forms described, but some discussion of their affinities also.

The ammonites here dealt with are those of the Upper Kimmeridge Clay, comprising horizons little known until recently, most field workers being familiar with only one member of the series—the Hartwell Clay. On account of the limited outlook of older English stratigraphers, this clay had been accorded the status of a mystery formation, and regarded as of Lower Portland Age. Although not observable at or near Hartwell, the subjacent strata can be studied at exposures in Oxfordshire, Wiltshire and Dorset. When Dr. Neaverson began this work, very few species were described from these rocks, and *Ammonites biplex* was the only term in the nomenclature of the unlearned. Although the ribs in some of the species do bifurcate, the forms now described differ from one another in almost every character. Four new genera and twenty-one new species have accordingly been established. The author should therefore encounter but little of the still-lingering prejudice against the making of new names—a prejudice that should be easily overcome by a study of the chapter on the requisites of a philosophical language, usually found in text-books of logic.

The material described in this memoir was obtained from the Hartwell Clay in the neighbourhood of Aylesbury, from the bituminous shales of Kimmeridge, Norfolk and Lincolnshire, and from clays and nodule beds in the brickyards of Wheatley, Shotover, Culham, Chawley, and Headington in Oxfordshire. Some of the forms are represented also in the Holderness Drift. *Virgatosphinctoides*, *Allovirgatices*, *Sphinctoceras*, and *Episphinctoceras* are the new genera established, the new species being referred to ten genera in all.

We should add that the memoir is handsomely illustrated by four colotype plates. As the first palæontological monograph among the 'Papers from the Geological Department of the University of Liverpool' it sets a high standard for those that are to follow, and the plan of the work could, with advantage, be used as a model for papers on ammonites.

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'Ammonites from the Upper Kimmeridge Clay,' by E. Neaverson. University of Liverpool Press Ltd., and Hodder & Stoughton, Ltd. Royal 4to. London, 53 pp., 4 plates, price 10/6 net.

## YORKSHIRE NATURALISTS AT HORNSEA.

DURING the week-end May 22nd to 24th, the Union held an excursion to Hornsea, making a fourth visit to this slowly disappearing watering-place. It will doubtless remain long enough to permit of many future visits by the Union, and each increment of sea encroachment, although deplorable from the civic view-point, will uncover some long buried object sufficiently interesting to excite the attention of the naturalist visitor. The excursion attracted a good gathering of members and associates, and with permission to visit that delightful bird sanctuary, Hornsea Mere; fine weather, and the necessary enthusiasm, naturalists had all they required for a pleasant and profitable week-end.

At a meeting held on Monday, May 24th, under the chairmanship of the President (Edwin Hawkesworth), reports on the work of the Sections were rendered by Messrs. J. W. Stather, T. Sheppard, H. B.



*Photo by*

**Yorkshire Naturalists at Hornsea.**

*[F. W. Mason.]*

Booth, T. Stainforth, Greevz Fysher, J. F. Robinson, W. E. L. Wattam and F. A. Mason. A hearty vote of thanks was accorded to Major A. J. Stather and T. Stainforth for the satisfactory local arrangements that had been made, and also to Mrs. Strickland-Constable for her kind permission to visit the mere.

**GEOLOGY** (J. W. Stather):—The coast of Holderness is remarkable for its almost unbroken line of boulder clay cliffs, extending from Bridlington in the north to Kilnsea in the south, a distance of 35 miles. Here and there, however, the continuity of the boulder clay is interrupted by hollows filled with peaty marl of lacustrine origin. The most extensive deposit of this kind in Holderness occurs at Hornsea, where the peat, under favourable conditions, has been traced on the foreshore for at least half a mile. At the present time the best exposure of these beds is at the south end of Hornsea beach, and on the Saturday afternoon a party of geologists, including the president, Mr. E. Hawkesworth, visited the spot.

On Whit Monday the geologists inspected the boulder clay cliffs between Hornsea and Skipsea. Unfortunately, at Hornsea, the best sections are concealed by sea walls and great masses of sand and shingle brought together by the numerous groynes, but at Atwick, two miles.

to the north, the sections were much clearer, and open to inspection. In this neighbourhood the signs of rapid coast erosion are very noticeable, and the shingle gatherers, who still ply their trade at Atwick, do not seem likely to suffer from lack of new material. The party ascended the cliff at this point, and examined a large accumulation of boulders and shingle which the men had brought up from the beach and sorted into heaps ready for carting away. The collection was an amazingly varied one, and established the claim of Holderness to be a glacial dump of the greatest possible interest. Specimens from such widely separated areas as the English Lake District, the Vale of Eden, Scotland and Scandinavia were quickly noted, and among the larger boulders many well-known North of England rocks were recognised. The secondary beds of Yorkshire were also well represented, and many lias and other fossils collected.

Continuing northwards the cliff sections between Atwick and Skipsea were found to be in a very good condition. The silty line which separates the Hessle Clay from the upper purple clay was traceable for a long distance, and the band of red clay (one foot thick) which Clement Reid regarded as the division between the upper purple clay and the lower purple clay was also well seen. Crushed and trailed-out chalk boulders were characteristic of this lower division.

At Skipsea, as at Hornsea, there is a hollow in the boulder clay filled with peaty marl, described long ago by Jno. Phillips. Since his time the deposit has suffered from the inroads of the sea, but much of interest could still be seen. The middle of the hollow was occupied by thick peat, with roots and branches of trees and hazel nuts, and at the southern end there was a yellow clay full of *Bythinia*, *Cyclas* and *Limnæa*.

Mr. T. Stainforth :—From the peat were obtained remains of the Red Deer, including the metacarpals and metatarsals, one of the phalanges and four vertebræ. As other Red Deer bones had been removed from the same spot, as we were informed by a resident, it is probable that a complete skeleton had been buried here. Single elytra of two beetles clearly recognisable as belonging to a species of *Donacia*, a genus characteristically associated with water plants, and the rib of a fish, probably pike, were also found.

A distinct 'horizon' of remains of the Swan Mussel (*Anodonta cygnæa*) was traceable in the section. The shells were in a very fragile state being represented by the chitinous periostracum, the aragonitic inner layers being greatly decomposed. The shells were covered with a bright blue film of the earthy form of the hydrated iron phosphate, vivianite, derived by reaction with the decomposition of animal matter. Vivid spots and patches of this mineral were exposed on breaking open the blocks of black peat.

ARCHÆOLOGY (T. Sheppard) :—At Skipsea Brough the party was met by the writer, and ascended the central mound of the remarkable series of prehistoric earthworks, which are some of the most important of their kind in the North of England. This mound covers seven acres, is 75 feet high, has a flat top an acre in extent, and is surrounded by a moat and earthwork. At a distance of 220 yards is a semi-circular series of earthworks, the mound forming the centre of the segment of the circle. These outer earthworks are half a mile in extent, average 75 feet in height, have a steep outer face, but there are platforms and trenches on the inner side. The whole forms a remarkable set of protective earthworks, possibly built during the Bronze Age. The land not protected by these earthworks was then an impassable swamp, such as indeed it is in quite recent times during very bad weather.

The central mound doubtless had as a nucleus a morainic ridge such as occurs at Catwick, Brandesburton, and other places in Holderness, but this had been carefully scarped and made into a perfectly circular

earthwork. Stone axes and bronze axes have been found in this vicinity, and quite close by, at Ulrome, were the famous pile dwellings, partly erected in the Neolithic Age and partly during the Bonze Age, which were excavated by the late Thomas Boynton in 1880. Later, during the occupation of the district by Drogo de Brevere, one of the followers of William the Norman, this central mound was utilised as a keep of his castle, though the whole of the structure which he erected seems to have disappeared, with the exception of one small part of the massive wall which still remains. This is composed of beach boulders, and doubtless the remainder of the castle has been utilised as a quarry for the erection of the numerous farms and other buildings in the district.

BOTANICAL SECTION (J. F. Robinson):—The bright sunshine after the clearing of morning mist or sea 'roke,' the dry condition of the ground, and the bracing air combined to form ideal conditions for the investigation of the flora of the district. Journeying through Holderness to the place of meeting, one realised that Chaucer's once 'merschlie londe,' now well drained and cultivated, has undergone a great transformation since the poet's day. At its vernal best, the green of pasture and meadows was fairly bedizened with the white and gold of daisies and buttercups, while the ruddier gold of the already well foliated oaks, so numerous in the East Riding landscape, shone brilliantly in the sun. Young corn looked green and healthy; and, although beans were short, probably from lack of warmth and moisture, they were flowering well and their delicate perfume was frequently perceptible.

Barbed wire did not prevent our little party from entering the damp wood on the edge of the lake at Hornsea; and, although the birds were numerous and attractive to most of us, the vegetal aspects generally, including that of Lichenology, upon which Mr. Wattam occasionally discoursed to interested members of the party, were by no means neglected.

The wood is very mixed in character, the principal trees being Oak—well in leaf and flowering profusely—Ash with scarcely a leaf as yet, Crack Willow, *Salix fragilis*, the small-leaved Elm, Alder, Sycamore Grey Poplar with an occasional Silver Birch, and Hawthorn in blossom.

The undergrowth was well advanced, and not very dense. In drier places big beds of Sweet Violet (*Viola odorata*) showing only the cleistogamous flowers or fruit, covered the ground. Germander Speedwell, Ground Ivy (*Nepeta*) and Red Campion dominated other spots, while occasional patches of Tway Blade (*Listera ovata*), not yet in flower, were intermingled with them.

In the ditches and damper spots in the wood *Epilobium parviflorum*, *Valeriana dioica*, *Iris Pseudacorus*, Gipsy wort (*Lycopus europhæus*), Skullcap (*Scutellaria galericulata*) and Bittersweet (*Solanum Dulcamara*) all occurred, but not yet flowering, except in the case of the valerian.

On the other hand in several of the shallow bays of the lake, Bog-bean (*Menyanthis trifoliata*) showed its feather fringed petals quite plentifully. The Greater Sedges, *Carex paludosa* and *riparia* abound on the sides of the mere, and with the common Reed, *Phragmites communis*, constitute the bulk of the semi-aquatic vegetation. Of the last, however, that which was most in evidence were the old, now almost plumeless stems or straws, of last year, and it was in masses of these that the Reed Warblers were so busy and pleasantly noisy. In the hedgerow near the wood the Spurge Laurel (*Daphne Laureola*) at its well known station still survives and fruits well.

On an informal excursion of the following day a party of botanists had visited Spurn, and among other things had brought to the meeting specimens of the Star-of-Bethlehem (*Ornithogalum umbellatum*), *Carex arenaria* and *Cakile maritima*, the first of which was perhaps the only fresh local record this Whitsuntide, and it is probably an old garden relict.

On Monday the route taken by the general body of naturalists was

around the south shore of the mere, and over the two well marked gravel terraces, former levels of the lake, now well overgrown with grass. The cold of previous weeks would be responsible for the lateness of vegetation in the more exposed situations of the south side. In the shelter of the wood near the Wassand end, however, there was a great difference in this respect, Bluebells (Wild Hyacinth) and Ransoms (Garlic) being abundant.

Beds of *Polygonum amphibium* in the water had little to show except the early floating leaves, those of the terrestrial form having just emerged. Indeed, it may be said of nearly all the species one expected to find that they were in the vegetative stage only, examples being common Meadow Rue (*Thalictrum flavum*), Greater Spearwort (*Ranunculus Lingua*), Marsh Stitchwort (*Stellaria palustris*) and Lousewort (*Pedicularis palustris*), which, it is pleasing to record, still luxuriate at Hornsea Mere. A feature of the Greater Spearwort to which attention does not seem to have been called previously, was the presence of submerged floating leaves of a membranaceous character, contrasting strongly with the upright, spearlike cauline ones that give this species its common name.

Ornithologists who had rowed round the mere helped the botanists to fine flowering specimens of Bog-bean, and to a number of the last season's fruiting stems and leaves of the Reedmace or 'Bullrush' (*Typha angustifolia*).

The grassy terraces yielded plentifully the flowers of *Orchis Morio* and the Milkwort (*Polygata serpyllacea*), but not plants of the Moonwort Fern (*Botrychium Lunaria*), although diligently searched for. The Adder's-tongue Fern (*Ophioglossum vulgatum*), however, was plentiful in several grassy places.

SPURN :—An excursion was made to the Spurn where the ternery was found to be in order. At Kilnsea Beacon the watcher had located six nests of the Lesser Tern and seven nests of the Ringed Plover. He had marked every egg with an indelible pencil in the usual way. Red-shanks and Green Plovers were also nesting.

BEMPTON :—Another party visited Bampton Cliffs, and found the bird life there just as great as ever. Kittiwakes are the dominant species, they catch the eye everywhere along the coast line. Razorbills are very abundant, and now appear to outnumber the Guillemots. The Fulmar Petrels are increasing rapidly, and are now well established. The birds were seen flying about the chalk escarpments all the way from Danes Dyke to Speeton Cliffs. The visitors hoped to have seen the Peregrine and Gannet, but the quest failed.

CONCHOLOGY (Greevz Fysher) :—The permission of Mrs. Strickland-Constable to visit her estate allowed the gathering of fresh water species at several points round the shores of the celebrated Mere, but a considerable portion of the margin was difficult of access owing to the growth of reeds and other obstacles.

*Anodonta cygnea* was well represented near the landing stage for boats, and in addition to this a moderate number of the more ordinary species were observed.

The beach at Hornsea is largely composed of shingle, which soon crushes and destroys many of the species of marine shells brought in by the waves.

Many of the common species which are sufficiently strong to admit of recognition after the rough treatment of the surf were abundant.

*Artemis exoleta*, which is believed not to be represented at the other beaches to which excursions have recently been made, is fairly plentiful at Hornsea. The following species were observed during the excursion :—

## MARINE.

<i>Calliostoma ziziphinus.</i>	<i>Venus gallina.</i>
<i>Gibbula umbilicata.</i>	<i>Pholas dactylus.</i>
<i>Littorina obtusata.</i>	<i>Barnea candida.</i>
<i>L. littorea.</i>	<i>Patella vulgata.</i>
<i>Tellina squalida.</i>	<i>Helcion pellucida.</i>
<i>T. tenuis.</i>	<i>Natica catena.</i>
<i>T. fabula.</i>	<i>Purpura lapillus.</i>
<i>Donax vittatus.</i>	<i>Nassa incrassata.</i>
<i>Mya truncata.</i>	<i>Buccinum undatum.</i>
<i>Macra stultorum.</i>	<i>Turritella tenebra.</i>
<i>Spisula solida.</i>	<i>Ocenebra erinacea.</i>
<i>Cardium norvegicum.</i>	<i>Saxicava rugosa.</i>
<i>Æquiptecten opercularis.</i>	<i>Ensis siliqua.</i>
<i>Pectunculus glycymeris.</i>	<i>Trivia europea.</i>
<i>Mytilus edulis.</i>	<i>Dosinea exoleta.</i>
<i>Vusella modiolus.</i>	<i>Ostrea edulis.</i>
<i>Anomia ephippium.</i>	

## FRESHWATER.

<i>Planorbis albus.</i>	<i>Bythinia tentaculata.</i>
<i>P. umbilicatus.</i>	<i>B. leachi.</i>
<i>P. spirorbis.</i>	<i>Sphærium corneum.</i>
<i>Limnæa peregra.</i>	<i>Pisidium 'sp?'</i>
<i>L. palustris.</i>	<i>Anodonta cygnea.</i>
<i>Valvata piscinalis.</i>	<i>Ancylus lacustris.</i>

## LAND.

<i>Helicella virgata.</i>	<i>H. hortensis.</i>
<i>Helix aspersa.</i>	<i>H. nemoralis.</i>
<i>H. cantiana.</i>	<i>Hygromia hispida.</i>

LICHENS (W. E. L. Wattam):—Lack of humidity, and most certainly lack of suitable habitats are doubtless the responsible agents for the paucity of the lichen flora. Beyond the erratic boulders along the coast there are no varied rock outcrops, therefore saxicolous species have to endeavour to establish themselves on the concrete facings of buildings, the walls of erratic boulders, and the lime grouting filling the interstices of the walls. Even the corticolous species, with one or two exceptions, are by no means common. My gatherings enable me to tabulate results as follows:—

- Calicium hyperellum* Ach. Boles of oak, small-leaved elm, in Mere Park.  
*Collema pulposum* Ach. On ground, streamside, Mere Park, and also on one of the islets, this latter being collected by Mr. Forrest.  
*Peltigera canina* Willd. On humus, wood, north side of the Mere.  
*Candelaria concolor* Wain. Old palings, north side of the town; boles of ash and small-leaved elm, Mere Park.  
*Evernia prunastri* Ash. Boles of oak and ash, Mere Park.  
*E. furfuracea* Fr. Similar habitat.  
*Ramalina fraxinea* Ach. Ash boles, Mere Park.  
*Platysma glaucum* Nyl. Boles of oak and crack willow, Mere Park.  
*Parmelis physodes* Ach. Boles of oak, ash, small-leaved elm and crack willow, Mere Park.  
*P. perlata* Ach. Boles of oak, Mere Park; apple tree in the village.  
*P. scortea* Ach. Boles of oak and ash, Mere Park.  
*P. saxatilis* Ach. Boles of oak, small-leaved elm and crack willow, Mere Park; f. *furfuracea* Schaer. Boles of oak and crack willow, Mere Park.  
*Parmelia dubia* Schaer. Boles of ash, oak and black poplar, Mere Park.  
*P. conspersa* Ach. Boles of oak and ash, and old palings, Mere Park.  
*P. fuliginosa* Nyl. Palings, Mere Park; var. *latevirens* Nyl., boles of oak, small-leaved elm, and crack willow, Mere Park.

- Xanthoria parietina* Th. Fr. Boles of crack willow, ash, small-leaved elm; erratic boulders in the village; var. *aureola* Th. Fr., boles of ash, Mere Park.
- Placodium flavescens* A. L. Sm. Mortar of walls in the village.
- P. citrinum* Hepp. Similar habitat.
- Candelariella vitellina* Mull-Arg. Earthen crevices and mortar of walls, old palings, in the village; boles of ash and oak, Mere Park.
- Physcia pulverulenta* Nyl. Boles of oak, ash, and small-leaved elm, Mere Park.
- P. hispida* Tuckerm. Boles of oak and ash, Mere Park; erratic boulders of walls, and concrete facings, in the village.
- Lecanora muralis* Schaer. Similar village habitats.
- L. subfusca* Ach. Boles of goat willow and oak, Mere Park.
- L. rugosa* Nyl. Boles of oak, Mere Park.
- L. campestris* B. de Lesd. Concrete facings in the village.
- L. pallida* Schaer. Boles of goat willow and young ash, Mere Park.
- L. galactina* Ach. Mortar of wall crevices village; sub-sp. *dissipata* Nyl., erratic boulders of walls in the village.
- L. varia* Ach. Old palings, Mere Park.
- L. conizæa* Nyl. Old palings and boles of Scot's Pine, Mere Park.
- L. symmicta* Ach. Old palings, Mere Park.
- L. calcarea* Sommerf. Mortar of wall crevices in the village.
- Pertusaria faginea* Leight. Oak and ash boles, Mere Park.
- P. pertusa* Dalla. Boles of oak and palings, Mere Park.
- P. Wulfenii* D. C. Boles of oak and small-leaved elm, Mere Park.
- Cladonia pyxidata* Hoffm. On humus base of trees and amongst mosses on fallen trees of crack willow, Mere Park.
- C. fimbriata* Fr. Similar habitat.
- C. gracilis* Willd. Moss covered boles of fallen crack willows, Mere Park.
- Lecidia querneæ* Ach. Bole of oak, Mere Park.
- L. coarctata* Nyl. On bricks, village.
- Rhizocarpon alboatrum* Th. Fr. Old palings, Mere Park.

The cliff tops from Bempton to Speeton was not very productive, no doubt due to the unsuitability of the boulder clay as a matrix, and severity of weather conditions and salinity upon the chalk cliffs. If access to the cliff face was more easy no doubt the following list would be greatly increased.

- Xanthoria parietina* Th. Fr. On erratic silicious boulders.
- Lecanora muralis*. Similar habitat.
- Candelariella vitellina* Mull-Arg. On old palings.
- Lcanora rugosa* Nyl. Similar habitat.
- L. conizæa* Nyl. Similar habitat.
- L. symmicta* Ach. Similar habitat.
- Pertusaria pertusa* Dalla. On erratic boulders.
- Cladonia pyxidata* Hoffm. On dead grass roots on the boulder clay.
- C. fimbriata* Fr. Similar habitat.
- Verrucaria rupestris* Schrad. On the chalk.
- V. calciseda* D. C. Similar habitat.

VERTEBRATE ZOOLOGY:—Mr. A. Badland writes: The ornithologists, under the able guidance of Mr. H. B. Booth, devoted most of their time in investigating Hornsea Mere, both on foot and by boat. This beautiful sheet of water, over 400 acres in extent, is very like a Norfolk broad, and is of supreme interest to bird lovers. The Mere, having been for many years under the care of the Protection Committee, is one of the finest sanctuaries of bird life in the county, and is a safe and favoured haunt of many delightful and unusual British birds. Coots were everywhere, and were often seen flying over the surface in small flocks. Pochards and Wild Ducks, too, were numerous, and there was a fair number of Waterhens. The members regretted to learn that the albino Mallard, which first appeared on the Mere about two years ago, was

unfortunately shot during the winter. A few pairs of Great-crested Grebes were noticed. One pair had a young one which, on the approach of the visitors, prudently clambered on the back of its parent. A Shag was seen several times about the water, and near the centre of the mere a Cormorant was watched. The white thighs and yellow gular pouch were plainly visible to the naked eye as the great bird perched on a post with wings uplifted in spread-eagle fashion. A few Herons, Tufted Ducks, Curlews, Carrion Crows, and many Herring Gulls, one Teal, and a few immature Lesser Black-backed Gulls were also observed. Among the jungles of common reeds (*Phragmites communis*) and lesser bulrushes, a large number of Reed Warblers and Sedge Warblers sang incessantly, though they were seldom seen. A few Reed Buntings kept them company. The ingenious and skilfully built nest of the Reed Warblers was discovered securely interlaced and entwined between four of the bamboo-like stems about three feet above the water. The nest swayed about with the bending of the reeds, but a Reed Warblers nest is deeply cup-shaped and rocks to and fro without any danger of the eggs being thrown out. Other small birds round and about the mere were Sandpipers, Yellow Wagtails, Garden Warblers, White-throats, one Blackcap, one Tree Creeper and large number of the commoner birds.

MAMMALS.—A freshly killed rabbit was found, and from the nature of the wounds it was assumed to be the work of a stoat. A pike, with the characteristic otter's bite in its shoulder, left no one in doubt as to the cause of its death. There are also rats and moles on the mere sides. After sunset there were transient appearances of bats, but the visibility being poor the observers were unable to identify them.

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**Lichens in North-east Cheshire.**—During a walk over Rakes Moss, near Crowden, on the 2nd August, I noted, in addition to many of the more common species, a very stunted form of *Cladina sylvatica* Nyl. among cotton grass, and, on many of the huge gritstone rocks, is the decumbent form *ceratea* Cromb. of *Evernia furfuracea* Mann.—W. E. L. WATTAM, Newsome.

**Vivipara connecta var. zebra Stenz.**—The *Vivipara connecta* var. *zebra* is a remarkable form, especially characterized by the striking alternation of the light and dark transverse growth-lines which encircle the last or body whorl of the shell, and also by the absence of the usual dark spiral banding. The epidermis, where still preserved, as on the ventral parts of the shell and about the sutures, is of a pale fawn or greenish-brown colour, but it has been largely lost or exfoliated from the dorsal parts of the shell, which are of a brilliant crystalline white on the spire, becoming duller on the body whorl. This variety was first described from Constantinople, and afterwards from the Lake of Geneva by Dr. Kobelt. Later it was discovered in the Marshes of Meyranne, Bouches-du-Rhone, by the well-known ornithologist, Dr. W. Eagle Clark, of Edinburgh. The specimens were collected in some numbers by Herr H. Petersen, at Riga, Latvia, and have been added to and enrich the Hans Schlesch collection in the Hull Municipal Museum.—JNO. W. TAYLOR, July, 1926.

## ENTOMOLOGISTS AT ALLERTHORPE COMMON.

W. D. HINCKS.

ON Saturday, June 12th, the Entomological Section of the Yorkshire Naturalists' Union paid a visit to Allertorpe. The weather was very disappointing, as had it been more favourable we should have found the locality a very productive one.

However, in spite of the rain some 'sweeping' was done, though the nets were soon wet through.

Mr. M. L. Thompson reports the following :—

### COLEOPTERA.

<i>Hydroporus melanarius</i> Stm.	<i>Polydrusus confluens</i> Steph.
<i>Melanophthalma gibbosa</i> Hbst.	<i>Rhynchites tomentosus</i> Gyll. (=
<i>Elater balteatus</i> L.	<i>uncinatus</i> Thoms).
<i>Phyllodecta vulgatissima</i> L.	

Mr. J. M. Brown writes :—The following are the Hemiptera I got in the few minutes I was able to collect :—

### HETEROPTERA.

<i>Scolopostethus decoratus</i> Hahn.	grass.
Under Calluna.	<i>Heterocordylus tibialis</i> Hahn. On
<i>Stenodema calcaratum</i> Fall. Among	gorse.

### HOMOPTERA.

<i>Oncopsis flavicollis</i> L. (including greenish-yellow form). On birch.	<i>Athysanus grisescens</i> Zell. New to Yorks. By sweeping.
<i>O. rufusculus</i> Fieb. On birch.	<i>Dicraneura variata</i> Hardy. By sweeping.
<i>Macropsis impurus</i> Boh. On <i>Salix repens</i> .	<i>D. flavipennis</i> Zett.

Messrs. W. D. Hincks and J. R. Dibb report the following insects :—

### LEPIDOPTERA.

<i>Polyommatus phlæas</i> .	<i>Acronycta rumicis</i> .
<i>Hippocrita jacobææ</i> . Common.	<i>Ematurga atomaria</i> . Common.

### ORTHOPTERA.

<i>Tettix bipunctata</i> . Common, mostly immature.	<i>Stenobrothus viridulus</i> .
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### HYMENOPTERA.

<i>Bombus terrestris</i> and <i>agrorum</i> . Common.	<i>Tenthredo olivacea</i> .
	<i>Tenthredopsis nigricollis</i> Cam.
<i>Allantus arcuatus</i> . Common.	

### DIPTERA.

<i>Anopheles bifurcatus</i> ♀.	<i>Empis tessellata</i> .
<i>Theobaldia morsitans</i> ♂♀.	<i>E. trigramma</i> .
<i>Pachyrrhina crocata</i> ♀.	<i>Thereva annulata</i> .
<i>P. quadrifaria</i> . Common.	<i>Sphærophora flavicauda</i> Ztt. ♂♀.
<i>Dolichopus atratus</i> ♂.	<i>Scatophaga suilla</i> F. ♂.
<i>D. unguilatus</i> L. = <i>æneus</i> ♂♀.	

### HEMIPTERA.

<i>Oncopsis rufusculus</i> .	<i>Megaloceraea ruficornis</i> .
<i>Psallus varians</i> .	

### COLEOPTERA.

(A few of these were captured during a later visit to the locality.)

<i>Miscodera arctica</i> .	<i>Cercyon flavipes</i> .
<i>Leistus rufescens</i> .	<i>Quedius molochinus</i> .
<i>L. ferrugineus</i> .	<i>Q. fumatus</i> .
<i>Harpalus æneus</i> .	<i>Homalium rivulare</i> .

<i>Adalia bipunctata</i> and the ab. 4-	<i>R. nanus</i> .
<i>maculata</i> .	<i>R. minutus</i> .
<i>Byturus tomentosus</i> .	<i>R. tomentosus</i> .
<i>Melanophthalma gibbosa</i> .	<i>Strophosomus lateralis</i> .
<i>Geotrupes typhæus</i> ♂♀.	<i>S. coryli</i> .
<i>Athous hæmorrhoidalis</i> .	<i>Phyllobius pyri</i> .
<i>Agriotes pallidulus</i> .	<i>P. urticæ</i> .
<i>Dolopius marginatus</i> .	<i>P. argentatus</i> .
<i>Trixagus dermestoides</i> .	<i>Polydrusus cervinus</i> .
<i>Telephorus bicolor</i> .	<i>P. pterygomalis</i> .
<i>T. lividus</i> .	<i>Sitona regensteinensis</i> .
<i>Rhagonycha pallida</i> .	<i>S. lineatus</i> .
<i>R. limbata</i> .	<i>Dorytomus salicis</i> (later taken in
<i>Malachius bipustulatus</i> .	greater profusion on <i>Salix</i>
<i>Gastroidea polygoni</i> .	<i>repens</i> ).
<i>Lochmæa suturalis</i> .	<i>Orchestes rusci</i> .
<i>L. capreae</i> .	<i>Anthonomus rubi</i> .
<i>Phytodecta vitellanæ</i> .	<i>Cæliodes quercus</i> .
<i>P. vulgatissima</i> .	<i>Anoplus plantaris</i> .
<i>Galerucella tenella</i> .	<i>Rhamphus pulicarius</i> .
<i>Luperus rufipes</i> .	<i>Sphæriestes castaneus</i> .
<i>Crepidodera aurata</i> .	<i>Anaspis maculata</i> .
<i>Cassida viridis</i> .	<i>A. ruficollis</i> .
<i>Rhynchites betuli</i> .	<i>A. rufilabris</i> .

Mr. W. J. Fordham writes:—I spent the period from June 9th to the 13th at Barnby Moor, and paid frequent visits to the common, and in spite of the rather unsettled weather obtained several interesting insects:—

HYMENOPTERA.

1. *Aculeata*.—A few species were taken, including *Halictus rubicundus* Chr., a strong colony in a sandpit at the Allerthorpe end of the common, where also a single *Epeolus p. oductus* Th. was seen.

Several *Gorytes mystaceus* L. were taken on raspberry blossom in the 'Black Planting.'

2. *Tenthredinidae*.—Sawflies were fairly numerous, and 25 species were taken, notably *Cephus pallipes* Klug., near Allerthorpe, which has been taken previously on the common. *Tenthredo temula* Scop., several, and *T. ferruginea* Schr., *Arge cyanocrocea* Forst. on Heracleum on the Sutton Road, *Pamphilus pallipes* Ztt. and *P. hortorum* Klug. on raspberry with the *Gorytes* above mentioned, and *Abia sericea* L., three in a pasture near Barnby Moor, two occurring on Knapweed. Its food plant, Devil's Bit Scabious, is abundant in this field later in the season.

COLEOPTERA.

The only beetle of note was a brilliantly-coloured specimen of *Pterostichus lepidus* F. The galls of a species of *Apion* occurred rather freely on *Rumex acetosella* in a sandy field.

LEPIDOPTERA.

Two specimens of the birch feeding large red-belted Clearwing Moth (*Sesia culiciformis* L.) were seen on raspberry in the 'Black Planting' and several 'skippers' of the species *Pamphilus sylvanus* Esp. and *Thanaos tages* L. were taken.

DIPTERA.

A careful search for *Zodion cinereum* F. in the last-mentioned locality, where it was taken last year singly by Mr. Cheetham, was unsuccessful, but a single specimen turned up on a buttercup flower on Sutton Road, where also occurred one *Dioctria atricapilla* Mg., also on a buttercup flower. *Chilosia albitarsis* Mg. was not uncommon on the same plant,

together with a large Anthomyid, as yet unidentified, which at first sight somewhat resembled it.

Several *Lasiopogon cinctus* F. were taken in sandy spots, and *Thereva annulata* F. was seen in similar localities. Its congener, *T. nobilitata* F. occurred on roadside herbage, but not as freely as usual. Other flies worthy of note were *Paragus tibialis* Fln., *Paloptera arcuata* Fln. on nettles, *Chilosia fraterna* Mg., two on buttercup and dandelion flowers respectively.

#### PANORPIDÆ.

The scorpion flies *Panorpa communis* L. and *P. germanica* L. were not uncommon about brambles and road side herbage.

—: o :—

### BRITISH BRYOLOGISTS AT INGLETON.

THE British Bryological Society came into existence, in 1922, by the amalgamation of the two sections of the Moss Exchange Club. The older society was founded in 1896, in response to proposals made by the late Rev. C. H. Waddell, in *The Journal of Botany*, *Science Gossip*, and *The Irish Naturalist*; its objects being to foster the study of Bryology, ascertain the distribution of bryophytes in the British Islands, and facilitate the means of exchange. Within six years Section II. was formed to meet increasing membership. In August, 1922, at an informal meeting at Dolgelly, it was decided to recommend the two sections to amalgamate; the suggestion was favourably received, and the re-organised society launched, with a new name and eighty-eight members (now exceeding one hundred), seven of whom dated their membership from 1896. The only important changes in the rules established an annual meeting, and admitted foreign and colonial members. The thirty years have produced useful work; that best of books, Dixon's 'Handbook of British Mosses,' the appearance of which coincided with the foundation of the Moss Exchange Club, has reached its third edition in response to the demand for moss literature; a companion volume, MacVicar's 'Handbook of British Hepaticæ,' which has been out of print for several years, has a second edition in the press; Horrell's 'Summary of the European Sphagna' after Warnstorf; Wheldon's 'Synopsis,' and Sherrin's 'Key,' have been efforts by members to bring into line Continental and British students of bog mosses.

E. C. Horrell's appeal, in *The Journal of Botany*, 1898, for aid in working out the distribution of British Mosses, stated that no lists of common species were known for 62 of the 112 Watsonian vice-counties; it must have been stimulating to the writer of that letter to see the enthusiasm with which the work was undertaken; one has only to compare the mass of detailed information in the Census Catalogues with the letter of 1898 to see that much has been accomplished; probably that outlet for its energy influenced the continued vigour of the Society.

Following Dolgelly, 1922; Buxton, 1923; Llanberis, 1924; and Ross, 1925; Ingleton was selected for the 1926 Annual Meeting, with headquarters at the Ingleborough Hotel. In spite of what threatened to be insuperable difficulties of transport, thirty-one made the rendezvous; such distant places as Belfast, Glasgow, Kent, Somerset and Devonshire being represented; one member arrived by taxi long after the last train, and another reported that on the return journey it took five and a half hours to reach the county boundary. Beautiful weather enabled the visitors to see the district under good conditions; the Ingleton glens, Ingleborough, Chapel-le-dale, Moughton, Crummackdale and Malham were worked under Mr. Cheetham's guidance, and the occasion was utilised to discuss some obscure forms of *Grimmia trichophylla* and *Trichostomum tortuosum* that have long been under observation.

The Chair at the Annual Meeting was occupied by Mr. H. N. Dixon

in the absence of Dr. MacVicar. The Rev. C. H. Binstead will proceed to the Presidency for 1927 and 1928; and Mr. W. E. Nicholson was elected Vice-President. Brecon was selected for the Annual Meeting, to be held in August, 1927, for which Miss Armitage and Mr. H. H. Knight undertook to make the local arrangements.

In the following list of the more interesting species seen, those marked with an asterisk are additions to the records for Mid-west Yorkshire (V.C. 64); vouchers will be placed in the Herbarium at Leeds University:

- Sphagnum rubellum* Wils. var. *viride* Warnst.  
 \**Dichodontium pellucidum* var. *compactum* Schp. On peaty flats, Southerscales.  
 \**Grimmia apocarpa* Hedw. var. *alpicola* Hook. and Tayl. Kingsdale Beck.  
*G. funalis* Schp.  
*G. torquata* Hornsch.  
*G. trichophylla* Grév.  
*G. Hartmani* Schp.  
*Barbula fallax* var. *brevifolia* Schultz., c. fr.  
 \**Trichostomum mutabile* var. *littorale* Dixon.  
 A plant which has been passed as *Trichostomum nitidum* was examined on Norber, and placed as a form of *T. tortuosum* on the ground that it lacked the colour, fragility and glossy nerve characters that are fairly constant in the former.  
*Encalypta rhabdocarpa* Schwaeg. Ingleborough, and on the open hillside above Crummack Farm.  
*Zygodon viridissimus* var. *rupestris* Hartm. Gordale.  
*Philonotis capillaris* Lindb. Ingleborough and the Glens.  
 \**Webera annotina* var. *bulbifera* Correns.  
*Bryum inclinatum* Bland. Near Thieves Moss.  
 \**B. caespiticium* var. *badium* Brid.  
*B. Mildeanum* Jur. Peaty flats, Southerscales.  
*Pylaisia polyantha* B. and S.  
 \**Brachythecium rivulare* var. *latifolium* Husn. Austwick Beck.  
 \**B. velutinum* var. *intricatum* Hedw.  
 \**Plagiothecium denticulatum* var. *obtusifolium* Hook. and Tayl. Ingleborough.  
*Hypnum chrysophyllum* Brid. Moughton, in several localities.  
 \**Aplozia riparia* var. *rivularis* Bern.  
 \**Lophozia bicrenata*. Kingsdale Beck.  
 \**Plagiochila asplenioides* var. *minor* Lindenb. f. *laxa* Matouschek.  
 \**Cephalozia myriantha* Schiffn.  
 \**Lepidozia reptans* Dum. var. *tenera* Nees.  
 \**L. reptans* Dum. var. *julacea* Nees.  
*Scapania Bartlingii* Nees. Ingleton Glens.

W. H. B.

—: o :—

**Rare Lichen in Yorks.**—During the British Bryological Society's foray in May last, Mr. H. H. Knight, of Cheltenham, gathered *Synechoblastus Laureri* Flot. (= *Collema Laureri*) in Ingleton Glen, V.C. 64. The only locality given in the British Museum monograph for this is Teesdale. That station was incorporated in the list for Middleton-in-Teesdale (*The Naturalist*, 1925, page 250), and Mr. Wattam informs me he knows of no other record for Yorkshire.—W. H. B., August 3rd, 1926.

## NORTHERN NEWS.

H. Donisthorpe describes *Corticaria corsica* Bris., a coleopteron new to Britain, in *The Entomologist's Record* for July.

'Furnaces, Blast, without Boshes,' is the title of a note in the *Bulletin of the Cleveland Scientific, etc., Institution*, though somehow it does not seem natural.

Dr. Wilfred Robinson, of the University at Manchester, whose work we have frequently referred to in these pages, has been elected to the Chair of Botany at Aberystwyth.

During the summer season several gentlemen at Bridlington have volunteered to be present at the Bayle Gate Museum each Saturday afternoon in order to conduct visitors round the collection.

Mr. H. J. M. Maltby, Superintendent of the Bolling Hall Museum, Bradford, since 1915, and Hon. Secretary of the Bradford Historical and Antiquarian Society, has been appointed Curator of the Salford Museum and Art Gallery.

The Summer Number of *Bird Notes* contains a Report of the Sixth International Ornithological Congress; the Report of the Royal Society for the Protection of Birds; notes on Wild Birds Protection Bill; Bird Sanctuaries; Economic Ornithology; the Oil Peril, etc.

As Dr. W. H. Pearsall is visiting America for twelve months, any communications our readers may have for the Secretaries of the Yorkshire Naturalists' Union should be sent to Mr. F. A. Mason, 29 Frankland Terrace, Leopold Street, Leeds, and not to the Leeds University.

The death is announced of the Rev. T. R. R. Stebbing, F.R.S., at the age of 91. He was an authority on Crustacea, in connection with which he did much work for the Challenger Expedition, and more recently his book, 'Faith in Fetters,' has commanded much attention.

The Beverley Literary and Scientific Society, after being in existence several years, has decided to 'wind up.' The attendances recently have been small, 'due to the introduction of wireless,' and 86 members have been 'lost' during the past two years. It was decided to sell the society's effects in order to meet its liabilities.

From an advertisement on a London theatre programme we gather that *Popular Science*, 'The Chatty Weekly,' which is sold at 2d., contains 'amusing stage stories,' 'charming love stories,' every newsagent sells it, and if you have anything to sell or buy, advertise in *Popular Science*. This looks as though science is at last becoming very popular!

—: o :—

**Life of Plants**, by Sir Frederick Keeble. Clarendon Press, pp. xii.+256. 'The growth of science is like that of a tree,' there are many branches, but we can only look for ripe fruit on a few of the twigs. Science is more than a body of doctrine, its aim is to illuminate life. Professor Keeble has tried to illustrate this by a resume of the life of plants, and says, 'I have not succeeded.' An attempt to cover so vast a field in a small book, and show what progress has recently been made is an impossible task, and evidence of this may be found by the very critical reader, yet the author has succeeded in producing a very readable and helpful book which all interested in plant life will be glad to possess. Much of the space is devoted to the various aspects of plant physiology and bio-chemistry, and the general botanist will find in these pages a clear and simple statement of the facts and theories relating to the living functions of plants. In this the author is to be congratulated, as the plant physiologist often does not realise how his work suffers by being expressed in language unnecessarily technical and too involved to be intelligible to the average reader.

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OCT., 1926.

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# YORKSHIRE NATURALISTS' UNION.

## BOTANICAL SECTION.

The Annual Meeting will be held in the Botanical Department of Leeds University on October 16th, at 3-30 p.m. and 6 p.m.

*Business.*—To suggest officers and members of committees, and to discuss the annual reports.

In the evening papers will be read and slides of modern and semi-fossil tree pollens from the peat will be shown under microscopes.

CHRIS. A. CHEETHAM.

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## VERTEBRATE SECTION.

*President of the Section* :—F. H. EDMONDSON, F.Z.S., M.B.O.U., Keighley.

Meetings will be held in the Library of the Leeds Philosophical Society, Park Row, Leeds, at 3-15 p.m., and 6-30 p.m., on Saturday, October 23rd, 1926.

Business at the Afternoon Meeting :—To consider and pass—(a) Sectional Reports for 1926, and to elect Officers for 1927 ; (b) The General and Financial Reports of the Yorkshire Wild Birds and Eggs Protection Acts Committee for 1926, and to elect this Committee for 1927 ; (c) The Report of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee for 1926, and to elect this Committee for 1927.

The following papers will be given :—

' A Report on the Sixth International Ornithologists' Congress at Copenhagen,' by F. H. Edmondson, F.Z.S., M.B.O.U.

' First Impressions of Lapland and its Bird Life,' by R. Chislett, M.B.O.U., F.R.P.S.

Members or Associates are invited to attend and bring notes, specimens and lantern slides. Will Officials of Affiliated Societies kindly notify their members?

E. WILFRED TAYLOR, *Hon. Sec.*,  
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## ENTOMOLOGICAL SECTION.

The Annual Meeting of this section will be held on Saturday, October 30th, in the Library of the Leeds Museum, Park Row, at 3 p.m. prompt.

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## NOTES AND COMMENTS.

### THE BRITISH ASSOCIATION.

The British Association for the Advancement of Science Meeting at Oxford was one of the best attended in the history of the Association, and doubtless the fact that H.R.H. the Prince of Wales was the President and attended the meeting had something to do with the increased attendance, although Oxford always has its charms and attractions for the visitor. Those who felt so inclined had more pabulum offered in the way of scientific papers than could possibly be digested, and as a relief to this were the visits to places in the neighbourhood, garden parties, and so on, which proved a source of attraction; and what with favourable weather and one thing and another everything seemed to go off satisfactorily. In many directions there was evidence of an increased interest in scientific matters, and, speaking for Hull alone (with which the present writer is fairly familiar), there were certainly more representatives from that city at Oxford than there have been at any meeting (with the exception, of course, of the Hull Meeting) that he has attended during the past thirty years.

### THE ADVANCEMENT OF SCIENCE.

Under the title of *The Advancement of Science*, the British Association has issued the Presidential Address of H.R.H. The Prince of Wales, and the addresses of the Presidents of the thirteen sections, together in one cover, at the price of 6/-. Those most likely to interest our readers are 'Progress in the Study of the Lower Carboniferous (Avonian) Rocks,' by Prof. S. H. Reynolds; 'Biology and the Training of the Citizen,' by Prof. J. Graham Kerr; 'Inheritance as an Economic Factor,' by Sir Josiah Stamp; and 'The Regional Balance of Racial Evolution,' by Prof. H. J. Fleure.

### PREPARATION OF THIN ROCK-SECTIONS.

Prof. W. T. Gordon stated that the origin of the idea of examining the internal structure of stony material by means of thin sections is quite uncertain, and was probably a development from the methods of early crystallographers, who prepared thin slices of minerals for optical examination. For instance, we find Brewster, in 1817, making slices of amethyst one-fiftieth of an inch thick for optical research. It is interesting to note that lapidaries were employed in preparing such sections, and, as these operatives had long been accustomed to prepare slices of agate and other materials for decorative purposes, we cannot be surprised that much credit is deservedly given to them. When the importance of the process was fully realised, it seems to have become impossible to give the credit to anyone in particular, but the

history of the method, so far as it is known, is not without interest. The earliest publication describing the process of manufacture was by Witham in 1831. He attributed his knowledge of the method to Nicol, and certainly described Nicol's modification of Sanderson's method. An enlarged work in 1833 does not contain this description, and on that account, as well as for other reasons, Nicol seems to have become incensed at the work and also the author.

#### NICOL'S WORK.

Nicol gave vent to his passion in a paper published in the *Edinburgh New Philosophical Journal*, and though petulant in tone, the article is of some importance in clearing up the vexed question about the origin of section cutting. Nicol makes no claim to have originated the idea, but states that the first 'in this quarter' (Edinburgh) to make thin sections of fossil plants was a lapidary, Sanderson by name—the man also mentioned by Witham. Sanderson's method was to slice a piece from the specimen and fix it down, by means of lapidary's cement, to a wood block, thereafter smoothing *and polishing* the exposed surface. The cement was softened, the slice reversed and the under surface now rubbed down until it was considered sufficiently thin for the purpose on hand. This surface also was polished, and, on re-melting the cement, the thin section, polished on both surfaces, could be mounted on a suitable piece of glass and examined under the microscope. Nicol's claim to consideration is that he substituted a glass plate for the wood block, and canada balsam for the lapidary's cement. Thus, he says, the specimen could be reduced to any desired thickness and could be examined at any stage. Now this is an important improvement of the older method, and Nicol states, in 1834, that he had been using it for fifteen years.

#### SORBY'S WORK.

Yet he did not appreciate to the full the importance of the process, and in the same article gives to Prof. Lindley the credit of having drawn attention to its possibilities. Yet Lindley in 1831 had already given that credit to Witham. The situation is further obscured by an editor's remark (at the end of Nicol's paper) that he—Prof. Jameson—had long known the method *and had advocated its use to geologists*. The latter phrase indicates that Jameson had foreseen what Sorby put into practice forty years afterwards. Truly both Brewster and Nicol had made thin sections of *discrete minerals*, but Sorby was inspired to apply the method to *rocks* after a visit to Edinburgh, where he examined the collection of slides and specimens belonging to Alexander Bryson. This collec-

tion contained Nicol's sections, as well as many prepared by Bryson himself, and its treasures were available for all those interested in the study. It is sometimes stated that Williamson, of Manchester, showed Sorby the method; but such is not the case, though he may have helped Sorby in the preparation of the sections.

#### MODERN METHODS.

Modern practice differs little from Nicol's improved process. It is true that *polishing* is no longer required, for the refractive index of canada balsam is sufficiently close to that of most rock-forming minerals to obviate the necessity of securing transparency by polishing the surfaces. The use of glass coverslip protects the surface from damage and renders the upper surface transparent, while the transference to a clean slip of glass gives a more workmanlike finish than was formerly obtained. Improved and new abrasives have 'speeded up' the manufacture, and an average section may easily be made in from twenty to thirty minutes. Dry grinding and wet grinding are both used, the former in special cases where the material might break down if wetted, while gum arabic, shellac, and other media are employed under certain circumstances.

#### MUMMIFIED FOSSIL PLANTS.

Dr. H. Hamshaw Thomas referred to his investigations of the structure of fossil plants. He stated that the old method of maceration which reveals the structure of cutinised cells can be used for some bulky remains, such as buds or fruits; and the membranes and remains of spores, which can often be extracted from them, show that some of the internal structure is preserved. A method has been devised for investigating the structure of the fruits of *Caytonia*, which at first seemed composed of homogeneous material. The fruits are removed from the rock, cleaned, softened, embedded in celloidin and cut into thin sections with a microtome. The sections, which show little or no structure, are now treated with reagents, which effect a partial solution of the material, and in so doing render the structure visible. Good results were obtained with  $\text{KClO}_3$  in strong  $\text{HCl}$ , followed by a very dilute alkaline solution. The sections were subsequently stained and mounted. By this treatment cutinised, stony or fibrous tissues become visible. Other solvents reveal the position of the middle lamella of the cell walls. The method is probably capable of extension to some other plant remains, but possesses certain difficulties.

#### LANCASHIRE MILLSTONE GRITS.

Mr. W. B. Wright read a paper on the 'Stratigraphical Diachronism in the Millstone Grit of Lancashire.' He stated

that an examination of the marine bands of the Millstone Grits and Lower Coal Measures of the Rossendale Anticline by the Lancashire Units of the Geological Survey has demonstrated on the whole the reliability of the zonal scheme established by Mr. W. S. Bisat. The goniatites, on which the system is based, being found only in thin bands at intervals throughout the succession, showed, at first, a fairly clear cut subdivision into species. The development being only recorded at well-spaced intervals, there was no baffling continuity of evolution. When, however, as in the upper beds, continuous exposure over a wide area allowed of more extended study, considerable lateral variation became apparent. This became distressing when it amounted to a distinct departure from type, and even more so when it led to the replacement of one zonal form by another in the same marine band, thus giving the impression that the zonal scheme might be, as regards its details, of only local value. The subsequent discovery that the variation was systematic put a new aspect on the question however, and it now seems as if what at first appeared a troublesome anomaly may, on the contrary, prove a valuable weapon in the study of the evolution of the goniatites and in determining the conditions of deposition in the Upper Carboniferous delta.

#### HASLINGDEN FLAG MARINE BAND.

It is highly improbable that the successive members of a faunal sequence can, under uniform conditions, occupy portions of the same sea not more than twenty miles apart at one and the same time. One must rather, in view of the species always maintaining the same order of development, regard them as absolute indices of the passage of time, and if so there is no escape from the conclusion that the Haslingden Flag Marine Band was not contemporaneous in the north-east and south-west. The idea is not a new one and analogous phenomena are demonstrable in almost every highly fossiliferous formation. It is now proposed to introduce the term *diachronous* to describe a bed having such relations to the zonal succession. The word is self-explanatory and avoids a cumbersome circumlocution. The essential peculiarity of the Haslingden Flag Marine Band is that it drops zonal forms at the base as it takes others on at the top. The relations of the Holcombe Brook Marine Band are somewhat different. When traced south and west it takes on zonal forms both at top and bottom. It is diachronous as regards its upper and lower limits; but synchronous as regards its centre. The  $\gamma$ -bed below behaves similarly and actually dies out to the north-east. The sea in which the two last-mentioned marine bands were laid down advanced from the

south and west and withdrew towards the same points of the compass ; that in which the Haslingden Flag Marine Band was deposited advanced from the north-east and withdrew to the south-west.

#### THE YORKSHIRE ESTUARINES.

Mr. M. Black gave a contribution on ' The Structure and Conditions of Deposition of the N.E. Yorkshire Estuarine Series.' These consisted in the main of inconstant though level bedded strata, but at some horizons intense current bedding is found as a result of the prolonged action of shifting river channels. The sequence of Middle Jurassic is interrupted by erosion and channelling at several well-marked levels, which are frequently characterised by systems of washouts. At the base of the Upper Estuarine Series there is evidence of a shallow sea giving place through phases of delta growth and shallow fresh-water lagoons to conditions of delta-swamps, and the preserved fossil floras are seen to change with the altering conditions of deposition. The characteristics of plant-beds which represent floras growing in place on the delta are quite distinct from those of beds made up of drifted fragments.

#### EARLY NATURAL HISTORY COLLECTIONS.

Dr. R. T. Gunther read a paper on ' The Collections of the Tradescants, Poynter, Dyer and Clutton.' He pointed out that these very early collections of objects of Natural History, though greatly reduced by neglect, not only include some of the oldest museum specimens known, but, taken together, illustrate in a unique manner the early history of museums in Great Britain. A few of the specimens that have survived the wear and tear of centuries have now been brought together for the first time in our oldest public museum building.

1. The John Tradescants, father and son, collected from 1627 to 1656. They founded the first London museum at Lambeth, and by their endeavours provided an incalculably great incentive to the exploration of the world by stimulating traders and travellers to take stock of the interesting and valuable produce of foreign countries. The contents of their museum were transferred to the Old Ashmolean Museum in Oxford in 1683, where they remained until 1860, when they were scattered. The gradual process of destruction of the historic specimens has been continued almost to the present day, and unless special care be taken of the few specimens that remain more will disappear. Those still extant represent about fifty species of animals, and in the opinion of many authorities should once more be brought together and be conserved as a collection.

## THE POYNTER COLLECTION.

2. John Poynter, chaplain of Merton College, made a general collection of naturalia, animal, vegetable and mineral, for the purpose of illustrating his lectures to his pupils. It is probably the oldest *teaching collection*, and without equal in Britain. Since about 1730 it has been in the possession of St. John's College, and although many specimens have perished, it has been possible, by good fortune, to save the remainder, in the original drawers. Of unique interest are the series of British birds' eggs representing about forty species, perhaps the only evidence for the existence of certain varieties of colour markings as long ago as the year 1700; a series of the rocks of Shotover Hill, perhaps the oldest stratigraphical collection of rocks now preserved to us; typical series of minerals, fossils and botanical specimens. The last includes an early series of Barbadian nuts and seeds given by Edward Dyer, a highly skilled botanist, fellow of Oriol College, 1673.

## THE CLUTTON COLLECTION.

3. The Clutton collection usefully supplements available scientific evidence as to the species of animals and plants used in medicine at the beginning of the eighteenth century. Other old collections of *materia medica* are less complete, or are not beyond suspicion, including substituted specimens of recent date. Joseph Clutton, an apothecary of repute living at the Turnstile in Holborn, sold the entire collection of 1032 specimens in a cabinet in 1729 to a Thomas Jobber for £21 6s. 8d. It became the property of New College at the death of Warden Oglander, and has been in cold storage in the muniment room of that college ever since. The specimens, including about sixty animals or parts of animals used in medicine, are thus nearly 200 years old. It has long been realised that museums impart knowledge with a precision and vividness which no mere literary description can give. These old Oxford collections, though few in number and diminutive in size, were made by the pioneers of the premier educational method of the science museum. They alone of many larger collections that have been destroyed now illustrate the early history of museums in Great Britain. Their adequate exhibition to the public in our own time, and a guarantee for their preservation for study by future generations, are therefore matters of paramount importance. Members of the British Association were invited to inspect them in the oldest public museum of natural history, the Old Ashmolean, in Oxford.

## EARLY CHARTS.

Mr. Michael C. Andrews referred to 'The British Isles in the Nautical Charts of the Fourteenth and Fifteenth Cen-

turies.' He stated although the southern coasts of England appear in the earliest known nautical chart, the mapping of the British Islands by the navigators of southern Europe was of later date than that of the Mediterranean Basin. While, owing to a lack of material, the origin and development of the Portolan Chart is still the subject of divergent theories, the evolution of this group can be traced from its earliest rudimentary form, through several stages of expansion, in the work of the Italian and Catalan cartographers. A comparative examination and classification of over one hundred examples, dating from the fourteenth and fifteenth centuries, demonstrate that the representation of the British Islands, during this period, may be assigned to four main types, each of which may be further sub-divided into several varieties. It is, therefore, possible to gain an adequate and not inaccurate general view of the work of two centuries from the inspection of a limited number of typical examples. Type I., *Genoese*.—(a) Early form, 1313-1321; (b) later form, 1327. Type II., *Venetian*.—(a) Early form, 1373-1421; (b) later form, 1408-1446. Type III., *Catalan*.—(a) Prototype, 1325-1339; (b) early form, 1375-1413; (c) revised form, 1426-1468; (d) standardised form, 1461-1584. Type IV., late Fifteenth Century (origin uncertain), 1462-1534.

## NEANDERTHAL MAN.

Prof. Sir William Boyd Dawkins, reported on 'The Range of the *Anthropus Neanderthalensis* on the Pleistocene Continent.' He said in dealing with the Neanderthal representative of existing man, it is convenient to mark his distinction from *Homo sapiens* by a different name—*Anthropus*—and to place him with the other members of the same indeterminate group under the name of *Anthropidæ*. These are, for the most part, so fragmentary that more evidence is needed before their place in classification can clearly be defined. We now know, thanks to Fraipont, Boule, Sollas, and Keith, the physical characters of the Neanderthal hunter, and Elliot Smith has shown the important points in which the Neanderthal brain differs from that of *Homo sapiens*, and is akin to that of the higher apes. The Neanderthal hunter had not yet attained the erect posture, and though he had a brain larger than that of the apes, his mentality did not come up to the standard of modern man. His true place in classification is, therefore, not with *Homo*; but with the *Anthropidæ*. The Neanderthal hunters ranged over a very large part of the Great Pleistocene Continent before the arrival of the Late Palæolithic tribes of the cave artists. Their skulls and bones have been found in the caves of Belgium, Middle and Southern France, and in the Mediterranean region

in the caves of Gibraltar and Palestine. They occur in association with Early Palæolithic implements, identical with those found in the river deposits over the whole of the intermediate areas. For these reasons the Neanderthal tribes may be taken to have been dominant in the Great Continent during the Middle Pleistocene Period, and before the arrival of the Artist Hunters, the earliest representatives of *Homo sapiens*—the Human Race.

#### THE NEOLITHIC AXE.

The same author referred to 'The Cult of the Neolithic Axe.' The stone axe used in ceremony by the natives in the Pacific Islands is held in regard because it had a place in their religion when they were in the Neolithic stage of culture, and the superstitions and mystical powers attached to Neolithic axes among both civilised and uncivilised races have their origin in a time when the stone axe was used in a Neolithic cult, just as the axe of bronze in the ritual of the Minoans, and possibly also of the early Greek worshippers of Zeus. It is probable that the cult of the stone axe was carried on after the Neolithic Age into that of Bronze, and possibly into the prehistoric Iron Age. The polished stone axe engraved on dolmens in Brittany probably belong to this cult, and the highly polished stone axes in the burial mounds of France, Germany and Britain were probably made for the cult and were not intended for use. They are all of the French type, with the small end tapering to a point, and are singularly perfect. The occurrence of one of these in a burial mound near Stonehenge makes it likely that it was used in the cult of that ancient temple.

#### CRESSWELL CRAGS.

Mr. A. L. Armstrong described 'Excavations in the Pin Hole Cave, Cresswell Crags.' A systematic archaeological exploration of this cave was commenced in November, 1924, upon ascertaining that the work there of the Rev. J. Magins Mello, in 1874, had been abandoned 23 ft. from the entrance. Excavations have now proceeded 12 yards beyond Mello's terminal point, and to an average depth of 12 ft. down to bed rock. Two layers of cave earth are present, the uppermost sealed by stalagmite or breccia and unbroken except in small limited areas, where disturbance has taken place to a depth not exceeding 18 in. The fauna is a rich one, and Pleistocene in character. Human artifacts occur throughout the upper cave earth of Aurignacian and Proto-Solutrian facies, including flint implements, amulets, bone tools, and an engraved lance point of mammoth ivory. Quartzite implements, considered to be Upper Mousterian, are found at the base of the upper cave earth. The lower cave earth contains

Lower Mousterian implements, and, near the centre of the deposit, artifacts resembling Acheulian types, together with tools of bone and mammoth tusk. Lance points of reindeer antler from the old Mousterian level are believed to be of a form new to science and ancestral to the single-bevel lance point. The physical character of the lower cave earth points to its accumulation having been completed before the floor of the Cresswell ravine was cut down to its present level, and the contained artifacts provide valuable evidence for defining the period during which this lowering of the valley took place, which may have an important bearing upon the geological history of the Derbyshire and South Yorkshire valleys in general.

#### RANUNCULUS AURICOMUS.

Prof. F. E. Weiss, F.R.S., read a paper on 'Unilateral Heredity in *Ranunculus auricomus*.' The Common Goldilocks (*Ranunculus auricomus*) occurs in two forms, one with five large yellow petals, and the other apetalous, the sepals being green on the outside but yellowish on the inside. The petaloid form has radical leaves finely dissected like the leaves of a buttercup; the apetalous form has leaves which are very little divided. While these two varieties are very distinct, one finds plants occasionally which appear to be of an intermediate type and possess a varying number of petals from one to five. It would appear as if these had been produced by natural crossing of the two varieties. To test this supposition reciprocal crosses were made with the two varieties, plants being used which had been selfed for several generations and proved to breed true to type. The seedlings from the outset showed a considerable difference. All those derived from crossing the petaloid form with pollen of the apetalous variety had dissected leaves, while those resulting from the apetalous form pollinated with pollen from the petaloid variety had almost undivided leaves. There was thus a marked contrast in the reciprocal crosses. The offspring with divided leaves all bore flowers with distinct petals, but the number of the latter showed considerable variation, the average number being three or four with a variation from one to five. In no case were they apetalous. These would, therefore, represent the forms occasionally found in Nature.

#### APATELOUS FLOWERS.

On the other hand, the offspring derived from the reciprocal cross showed no intermediate condition, but were, with one exception, all apetalous and exactly like the female parent. As there seemed a possibility that this striking occurrence might be due to apogamous reproduction, castrated plants were left unpollinated, but no seed production took place.

Two further generations have been bred from these crosses, but the plants continued to bear apetalous flowers and leaves with very slight incisions exactly like the female parent, from which they have sprung. This crossing, therefore, seems to result in what Blaringhem calls 'unilateral inheritance,' similar to the results obtained by Gaertner in the case of *Lychnis flos cuculi*, by Millardet with various species of *Fragaria* (fausses hybrides), and by Griller in his crosses of *Vitis* and *Ampelopsis*.

#### THE HERBAL OF APULEIUS BARBARUS.

Dr. R. T. Gunther said the drawings of plants in the manuscript of Apuleius Barbarus, known as MS. Bodley 130, are believed to have been executed about the year 1100 in the Abbey of Bury St. Edmunds, and must, therefore, be regarded as the earliest English plant drawings known. Two types of drawings are distinguishable: (a) Conventional figures, crudely executed and coloured, which from having been repeatedly recopied, have lost all semblance to the plants which they are supposed to represent; some of these appear to preserve the Discoridan tradition of plant illustration, (b) Naturalistic figures which have obviously been drawn direct from the living plant. The MS. has recently been reproduced in facsimile by Captain Spencer Churchill for distribution to members of the Roxburghe Club.

#### BLUE-GREEN ALGÆ.

Dr. H. Wager, F.R.S., referred to the 'Carbon Assimilation in the Blue-green Algæ.' Since the discovery, by Errera, many years ago of the existence of glycogen in the cells of species of the blue-green algæ, evidence has been brought forward to show that in this group of plants glycogen is probably a product of carbon assimilation. In the present paper this evidence is summarised, and further experiments, including the growth of specimens under different coloured light filters, both in the presence and absence of light and carbon dioxide, all of which tend to support this conclusion, are described. The spectroscopic examination of various species also shows that in relation to the formation of glycogen, the light rays absorbed by the phycocyanin colouring matters, as well as those absorbed by the chlorophyll, are concerned in the process.

#### VEGETATIVE PROPAGATION.

On this subject Prof. J. H. Priestley pointed out that for the perpetuation of many strains of cultivated flowering plants which are the product of long periods of selection and hybridisation, no method is available save that of vegetative propagation, and no practice is more commonly employed in

horticulture. At the same time success or failure in vegetative propagation is a matter of experience, and generalisations as to the conditions for successful propagation are founded upon empiricism. A study of the process of vegetative propagation in the light of the development and anatomy of the flowering plant suggests that importance attaches to the following considerations:—1. Roots and shoots differ in their mode of growth and in their nutrition under conditions of vegetative propagation; they originate in different tissues and their production is differently affected by external conditions. 2. The production of new roots and shoots in a Monocotyledon is a very different problem from that presented by the Dicotyledon. In the latter the new growing points arise in close association with the two cylinders of secondary meristematic tissues, the vascular cambium and the cork phellogen. It is suggested that no interpretation of vegetative propagation will prove practicable until a much wider knowledge is obtained of the processes governing the origin of meristematic tissue and its maintenance in healthy activity. From this standpoint the conditions governing the activity of the two cambial cylinders of the Dicotyledon are briefly examined.

#### PHYSIOLOGY OF SPHAGNUM.

On this subject Dr. M. Skene and Miss G. L. Stuart reported that the cause of the sensitiveness of Sphagnum to alkaline solutions has been investigated by a new method. By using carbonate-bicarbonate buffer solutions it is possible to vary the hydrogen-ion concentration and the concentration of salts independently, and to show that low values of the former and high values of the latter cause injury. Marked antagonism between different bases exists under certain conditions. No evidence was obtained of the dependence of healthy growth on a particular basic ratio. The cause of the acidity of salt solutions in contact with Sphagnum has been shown to be the liberation of the free acid of the salt employed. The reaction is probably due to the phenolic compound present in the cell walls described by Czapek under the name 'sphagnol.' A method of destroying this substance and of permanently depriving the wall material of dead Sphagnum of its acid properties has been found. This may have practical importance in the treatment of acid, and especially of peaty, soils.

#### BRITISH FRESHWATER PHYTOPLANKTON.

Dr. B. M. Griffiths pointed out that the free-floating microflora (phytoplankton) of ninety-four English lowland waters has been examined. The phytoplankton considered as one of the communities of aquatic plant association. Its habitat conditioned by initial water supply, size of basin,

local topography. The salts-abundance habitat ; its micro-, mero-, and holophotic variations and associated plankton types ; relation to corresponding salts-deficiency habitat. General habitat ranges of common species. Relation of British freshwater phytoplankton to that of other regions.

A 'MAY' BE(E).

The Editor of *The Tatler* permits us to carry out the wishes of a number of our readers in reproducing an impression by Fred May of one of the officials connected with *The Naturalist*.



He evidently caught the individual in question in the act of hurrying round the various sections and committee rooms gathering information for his journal. He is described as a 'hyper-scientist.'

#### LINCOLNSHIRE NATURALISTS.

*The Transactions of the Lincolnshire Naturalists' Union* for 1925 contain the usual record of valuable reports of the various sections of the Union's activities, as well as a useful list of Lincolnshire Fungi compiled by the late Sir Henry Hawley and the late W. N. Cheesman ; and a paper on 'Economic Oecology in North Lincolnshire,' by A. Roebuck. There is a memoir and portrait of the Rev. Canon A. N. Claye, the twenty-first President of the Lincolnshire Naturalists' Union. We are sorry to find that the Union owes its Secretary a shilling.

## BRITISH MYCOLOGISTS.

J. Ramsbottom has a particularly fine appreciation of the late William Norwood Cheesman, of Selby, accompanied by an excellent portrait, in *The Transactions of the British Mycological Society* just issued (168 pp., 15/- net). Though a native of Winterton, Mr. Cheesman spent most of his long life in Yorkshire, and his intimate association with the Yorkshire Naturalists' Union and *The Naturalist* is described in detail. Mr. Cheesman left the Mycological Society one hundred guineas to assist them in their publications. The Transactions referred to contain a remarkable series of well illustrated memoirs by E. M. Wakefield, H. H. Knight, A. L. Smith, M. C. Knowles, G. Lister, T. Petch, N. Dobson, W. M. Ware, H. G. Derx, W. Small, I. Maxwell, G. B. Wallace, J. McDonald, W. J. Dowson, and N. L. Alcock. The Tintern and Dublin Forays are responsible for many of the contributions, and several of the papers are of distinct economic value, notably, Lichen Dyes; The Toxicity of the Spores of *Tilletia Tritici* to Animals; Black Rust in Scotland; A Preliminary Account of a Disease of Green Coffee Berries in Kenya Colony; On a Core Rot and Premature Fall of Apples associated with *Sclerotinia fructigena*; and Successional Disease in Plants as shown in Willow Rods.

## THE SILVER FIR CHERMES.

This pamphlet, by R. Neil Chrystal, published as Bulletin No. 7 of the Forestry Commission, contains a study of the two silver fir chermes (*Dreyfusia*) which have now become serious enemies of the silver fir (*Abies pectinata*) in Britain. Attempts to combat the destruction of plantations by these pests have been defeated by the lack of accurate knowledge of the life cycle of the species under the conditions obtaining in this country, and the author has rendered a service to forestry by his investigations which have suggested means for growing with success a valuable timber tree hitherto frequently lost at a critical youthful stage. The subject matter is of interest to the botanist and to the entomologist as well as to the forester, for whom it was been mainly written. The Bulletin is well illustrated with photographs showing the result of chermes attack, etc. Copies may be obtained from H.M. Stationery Office, Adastral House, Kingsway, W.C.2, for 1/6 net.—F.A.M.

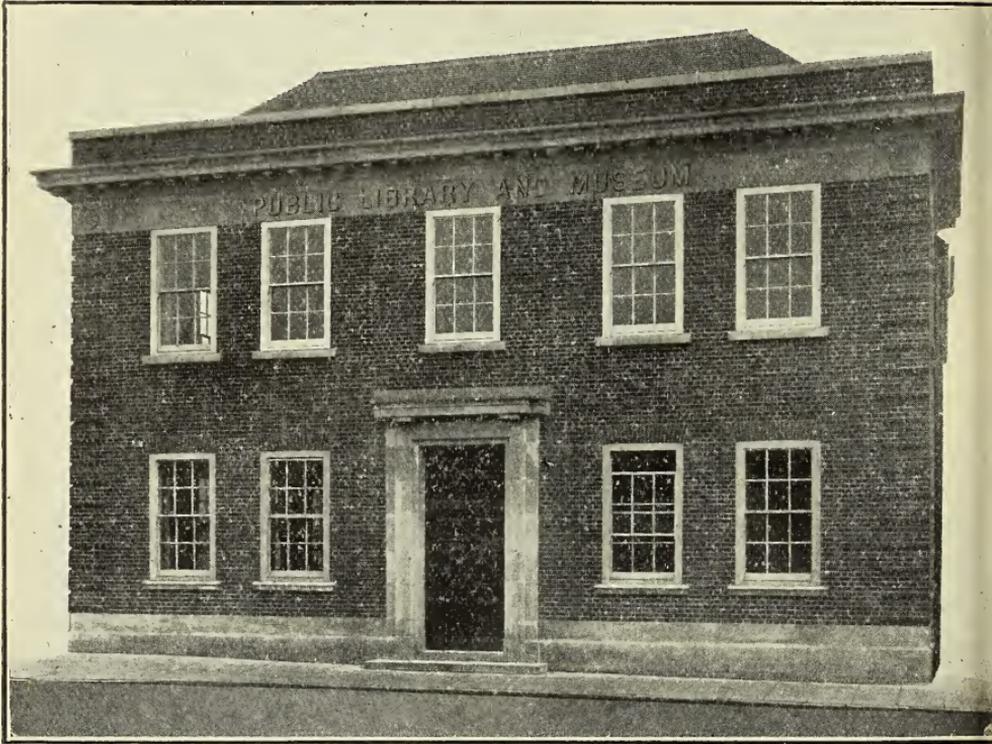
## LOBSTERS.

The Inter-departmental Committee on Crabs and Lobsters has issued its *Report on Lobsters* (34 pp., 2/6 net), giving statistics and charts relating to the status of the lobster round the British Islands. The Committee comes to the conclusion that the statistical evidence at present available does not

justify any recommendation for immediate legislation having for its object additional protection for the lobster, but recommends that further statistical data should be collected, and that the position should be reviewed from time to time in the light of the additional evidence obtained. The Report can be obtained from H.M. Stationery Office.

#### GRANTHAM MUSEUM.

The Grantham Public Library and Museum has issued its *Fourth Annual Report* (14 pp.), which contains a view of the



new building recently opened. The Chairman, Mr. Henry Preston, gives some notes on the Seventeenth Century Tokens in the Museum, including two hitherto unknown. We are permitted to reproduce the illustration of the new building.

#### CLEVELAND NATURALISTS.

The Cleveland Naturalists' Field Club is to be congratulated on Part IV., Vol. III. of its *Proceedings*, just issued. This part completes Vol. III., and is full of valuable material, attractively presented, and indicates a commendable activity in the Society concerned. Mr. J. J. Burton contributes a paper on 'Roseberry Topping in Fact and Fiction,' a very

readable and well-illustrated all-round account of that well-known feature of the Cleveland Hills. Mr. E. W. Jackson follows with some careful notes on the 'White Flint near Lealholm,' and discusses the origin of the mysterious cone-like structures in the Estuarine quarry near Stonegate. The pictures of the cones are good, but are surely printed from process blocks, and are not 'actual photographs' as stated. The paper entitled 'The Mound Breakers of Cleveland,' by Mr. William Hornsby, is excellent, and will interest both the advanced Archæologist and the general reader. Mr. J. Ingham writes on the 'Peat Deposits at Hartlepool,' and Mr. M. L. Thompson on 'Coleoptera observed in Cleveland.' There are also short memoirs of three old members of the Club who recently, alas, joined the great majority.—J.W.S.

#### OIL MENACE.

At the invitation of the Director, the present writer paid a visit to the British Museum (Natural History), where a special exhibit illustrating the effects of the Oil Menace has been placed on exhibition in the central hall. This is a large case representing a section of a typical sea beach, with the usual accumulation of pebbles, seaweed, etc., among which are several Divers represented as dead or dying as a result of the coating of thick oil on their feathers. This graphically illustrates the effect on bird life of the waste oil which at present is allowed to be dumped into the sea.

#### FOOD FISHES.

The 'Fisheries Investigations' has issued an exceptionally useful *Report on the Distribution of the Food Fishes in the North Sea* during 1923 and 1924, by J. O. Borley, with 'Notes on the Natural History of the Food Fishes of the North Sea,' by D. E. Thursby-Pelham.\* This contains a series of over forty charts, together with a transparent key, issued separately, which can be placed over any of them. The Charts constitute an attempt to portray the quantitative distribution of the marketable sizes of the principal food fishes in the North Sea in 1923, and of the most important of them in 1924. All fish taken by the trawl are treated, but species such as Herring, which are taken largely by other nets, are dealt with only in as far as they are trawled fish, while others not taken by the trawl are omitted. The Charts, in other words, deal with Demersal fish.

#### SAVE OUR RIVERS.

We have received a pamphlet 'Save our Rivers and Inshore Waters' (12 pp.), issued by the Pure Rivers Society of 1 Lincoln's Inn Fields, London, W.C. The object of the

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\* Ser. II., Vol. IX., No. 4, H.M. Stationery Office, 14 pp., 4/6 net.

Society is 'To bring about co-operation between Landowners, Farmers, etc. It is also hoped to benefit the members (1) by forming a very storehouse of information—practical, scientific and legal—on the subject of river and sea pollution. (2) Also to band together all the different classes of the community who suffer from river pollution, including our greatest industrialists, the farmers. (3) To educate the Public in the importance to the community of pure rivers and seas. (4) To give useful advice and information to local Authorities. For instance, many towns pollute simply because their expensive and elaborate sewage works are misunderstood and neglected. (5) To point out to manufacturers methods of utilising their wastes, as, for instance, that milk factories would make larger profits if they utilized their whey as is done in Holland, instead of pouring it into hitherto unpolluted rivers. (6) To advocate the recommendations of the Royal Commission on Sewage. (7) To watch legislation.'

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Mr. J. Bailey's Presidential Address on 'The Carnegie Trustees and Provincial Museums' appears in *The Museums Journal* for August.

*The New Phytologist*, Vol. XXV., No. 2, contains a paper by J. C. Waller on 'The Katharometer as an Instrument for Measuring the Output and Intake of Carbon Dioxide by Leaves.

*Ours*, the magazine of Reckitt's for July, is largely devoted to a well illustrated account of the old whaling days in Hull, the pictures being taken from paintings and specimens in the Museum of Fisheries and Shipping at Hull.

The Editor of *British Birds*, in his September issue, mentions the Report of the Yorkshire Naturalists' Union in *The Naturalist* for January last, page 11, and refers to the Hobby's nest near Terrington, Yorkshire, etc., under the heading of 'Unlikely Records in Yorkshire.'

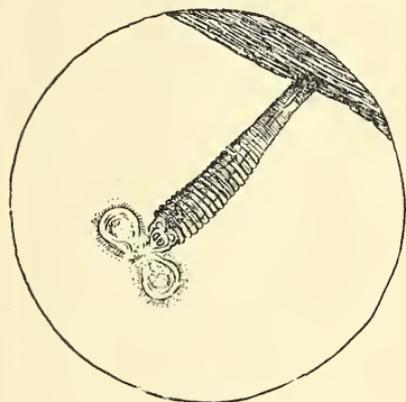
Mr. J. R. Moir in *The Connoisseur* for September has an article on some scratched flints which were found by Mr. A. L. Armstrong some years ago, and at the time doubt was thrown upon their authenticity in *The Naturalist*. It is difficult to understand why, without any fresh evidence, these have now been figured in *The Connoisseur*. Possibly next month Mr. A. L. Armstrong will retaliate and tell us something about the so-called model mammoth found some years ago by Mr. J. R. Moir, which the late Sir Henry Howorth and others pointed out at the time was part of an ammonite! Mr. Moir did promise a further monograph on this subject, but although the pages of this journal were offered to him for the purpose, it has not yet appeared.

*The Journal of Ecology* for August, edited by Professor A. G. Tansley, is one of the most important publications yet issued by the British Ecological Society, and contains no fewer than 180 pages, with numerous plates and illustrations in the text, maps, sections, tables, etc. (22/6 net). The principal papers are 'Sphagnum Bogs of Central Russia: Phyto-Sociology, Ecology and Succession,' by N. J. Katz; 'Studies on the Ecology of English Heaths,' by V. S. Summerhayes, P. H. Williams and O. W. Richards; 'Yew Communities of the South Downs,' by A. S. Watt; 'The Vegetation and Retrogressive Changes of Peat Areas in Central Alberta,' by F. J. Lewis and E. S. Dowding; and 'The Salt Marsh Vegetation of Little Island, Co. Cork,' by R. H. McCrea.

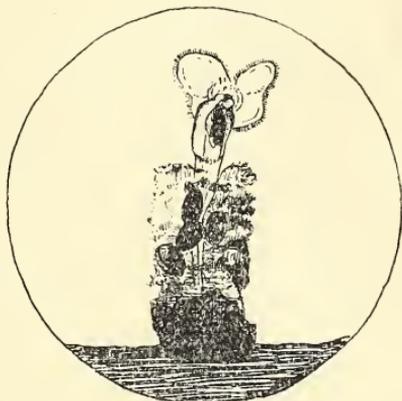
## RARE ROTIFERS NEAR DONCASTER.

M. YATE ALLEN.

ALTHOUGH I fear there are not many naturalists who take a working interest in the micro-biology of our ponds and slow-moving streams, yet the finding of two very interesting rotifers in one week compels me to give a short account of them in the hope that the interest they arouse may encourage others to take up this neglected branch of natural history. To take a photograph of a rotifer when actually working is said by some to be impossible. Perhaps it has never been achieved



*Limnias annulatus.*



*Megalatrocha velata.*

(After photos by M. H. Stiles).

to perfection, but my friend, Mr. M. H. Stiles, of Doncaster, one of the oldest members of the Union, and over 80 years of age, has made a very creditable attempt. As, however, they may suffer too much in reproduction, I have copied his photos in Indian ink so that readers may see what the creatures are like.

The first I found in a stream close to the mere on the Lindholme estate by Hatfield Moor, attached to some myriophyllum. I found a number of cases, but only one alive and working. In the older editions of the Micrographic Dictionary it is omitted, but is just mentioned in the later editions as having been found by Gosse, and is also in Pritchard's 'Infusoria.' It is the *Limnias annulatus*, one of the Floscularia family of the Rhizota. There are two species. The other, *L. ceratophylli*, which I have also found, has its hyaline case coloured through debris adhering to its viscid walls, somewhat resembling a melicerta. This species, however, I have never seen before, and it is remarkable in having its case composed of perfect rings, as will be seen in the illus-

tration. At first I mistook it for a melicerta, though the rings soon disabused me. When it comes out from its case, moreover, there is no doubt about it, for it has but two lobes instead of the four of the melicerta, and is quite differently formed. It is about  $\frac{1}{30}$  of an inch long. Although I said that Mr. Stiles took the photos, yet in this instance he merely photographed the case, for, though it was alive when I set out to show him the specimen, it unfortunately died on the way, at any rate it never came out again. I had, therefore, to put in the lobes myself, drawn from memory.

The other creature gave me even more pleasure to discover, for, although my father, whom some of the older members may remember (Rev. F. H. Allen), discovered one some years ago, I have never before succeeded in finding a megalatrocha. His specimen was the *Megalatrocha Albi-flavicans*. He and a friend had been searching water taken from a pond near Sykehouse, and the clock had just struck 2 a.m. They were on the point of retiring, when suddenly my father found the coveted rotifer. I believe they did not go to bed at all that night! This find of mine is, I believe, quite as rare, if not more so, than the *flavicans*. It is the *Megalatrocha velata*. At first sight one would put it down as a floscule because of the case. But in reality it has no case any more than the *flavicans*. It surrounds itself with what Pritchard calls an integument. It is a viscid shapeless mass, more or less surrounding it. As this becomes covered with debris it gradually assumes the appearance of a case, and even Mr. Stiles at first mistook it for a very much dilapidated melicerta. There is no mistaking it however. In the first place the so-called case is nothing like the neatly built edifice of the other, and the presence of the ova, five in this instance, and the butterfly-shaped lobes, confirm this diagnosis. In the *flavicans* the ova are usually attached to the parent by thin cords, but this creature allows them to be kept near him by the integument. It is about  $\frac{1}{20}$  of an inch long, and with the dark background illumination is a very pretty sight. The integument is an amber colour, transparent, and the creature itself silvery white, so that with the rapidly moving lobes or wheels it makes a very striking picture.

If any readers have found either of these two rotifers I should be immensely glad to hear from them, and I trust this short record of the find may enthuse energy into others to take up the search for these wonderful creatures, which may be compared to Gray's 'Gems of purest ray serene which the dark unfathomed caves of ocean bear.'

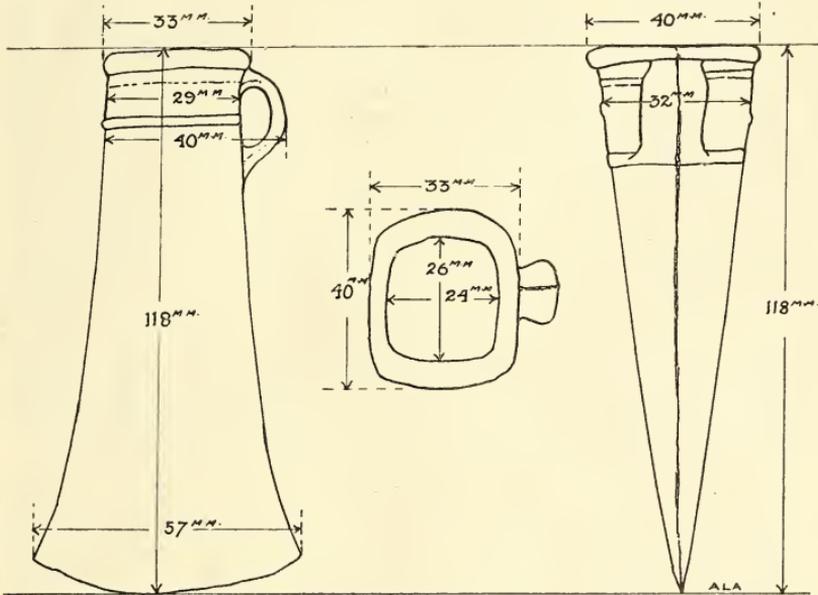
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H.M. Stationery Office is advertising the Geological Survey Memoirs for the use of 'holiday makers.'

## BRONZE AXE-HEAD FROM HOLDERNESS.

T. SHEPPARD, M.S.C.

THE accompanying illustration is of a socketed axe found on a farm at Riston in Holderness some time ago. It is covered with a fairly thick patina, though this is of a brownish tint, as though the axe had been buried in peat. It is rather larger than usual for an axe of this type, is wedge-shaped, with a square end for the socket. The decoration consists



of three slight ridges forming a collar, though this is hardly shown where the handle is, and on the side opposite to the handle. There are only the very faintest traces on one side of the three vertical ridges which usually decorate axes of this type.

The specimen is  $4\frac{3}{4}$  inches long,  $1\frac{1}{8}$  inches broad at the base of the handle, and the cutting edge is  $2\frac{1}{4}$  inches in length. The socket is deep, being  $3\frac{3}{4}$  inches. The weapon weighs  $12\frac{1}{2}$  oz. The original is in the possession of Dr. T. Jackson, who has kindly allowed us to make a cast of it. Mr. A. L. Armstrong has kindly provided the sketch.

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The writer of these notes was recently waiting the arrival of a specialist in a certain branch of palæontology in one of the Government Survey Offices, and to pass the time away was curious enough, by examining the labels on the boxes, to endeavour to find out what particular species were being studied by the staff at the moment. These turned out to be 'Sunshine Toffee,' 'Oxo in Cubes,' 'The Slezenger Ball,' 'Chocolat Surfin,' and 'Gold Flake.'

## In Memoriam.

A. W. ROWE, F.G.S.

WE regret to record the death of Dr. A. W. Rowe, M.S., M.R.C.S., F.G.S., who has done so much towards zoning the chalk. It will be remembered that in a series of valuable memoirs dealing with the Zones of the White Chalk in various parts of the country, written in conjunction with Mr. C. Davies Sherborn, and published by the Geologists' Association (1900-1908), one dealt with the Chalk of Flamborough Headland, and contained an enormous amount of detailed information relating to the numerous exposures of the chalk in quarries and cliff sections. In connection with this particular memoir a large model of Flamborough Headland, to scale, was prepared, on which the different zones were indicated by means of colours. The authors presented this model to the Hull Museum. Dr. Rowe also contributed a paper on Micrasters to *The Quarterly Journal of the Geological Society* (1899), and was particularly successful in extracting fossils from their matrix by the aid of a dental machine. He had an extensive collection of chalk fossils at his house in Margate, and at the time of his death, which occurred suddenly, on September 18th, due to blood poisoning, he was engaged in examining the chalk serpulæ.—T.S.

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Professor J. H. Priestley writes on 'The Anatomy of Etiolated Plants' in *The New Phytologist* for July.

*The Vasculum*, No. 4 of Volume XII., contains the following: 'British Harvestmen,' by J. E. Hull; 'The Sneap'; 'The Lepidopterous Genus, Tephrosia, and certain of its Allies in Northumberland and Durham,' by J. W. Heslop Harrison; 'Minerals of the North Country,' by J. A. Smythe; and 'Red-necked Grebe in Northumberland in Summer,' by A. Chapman.

*The Quarterly Journal of the Geological Society*, No. 326, contains 'The Pleistocene Deposits of the Lower Part of the Great Ouse Basin,' by J. E. Marr; 'The Black Mark of Black Ven and Stonebarrow in the Lias of the Dorset Coast,' by W. D. Lang and L. F. Spath; 'Faunal Succession in the Carboniferous Limestone and Bowland Shales at Clitheroe and Pendle Hill,' by D. Parkinson.

*The Essex Naturalist* (September) contains Sir Arthur Smith Woodward's Presidential Address on 'The Fossil Fishes of the Chalk' (in which Lincolnshire specimens described in *The Naturalist* are referred to); 'The Beetles of a Forest-side Garden,' by W. A. Wilson; 'Excavations in Pillow Mounds at High Beach,' by S. H. Warren; and an obituary notice of Alfred Bell (1835-1925) with portrait.

In the *Transactions of the Caradoc and Severn Valley Field Club*, Vol. VII., No. 5 is a record of the various Field Meetings of the Club, and an interesting paper on 'Early Brickwork in England,' by H. E. Forrest. The same Society has published No. 35 of its *Record of Bare Facts* for the year 1925, in which, in condensed form, new records of animals and plants in the sphere of the Society's activities are given, as well as useful Meteorological Tables.

## FIELD NOTES.

**Worm Pipe-fish at Scarborough.**—On July 30th, 1926, I caught in a rock pool at extreme low spring tide a Worm Pipe-fish (*Nerophis lumbriciformis*),  $3\frac{1}{8}$  inches in length. In colour it was yellowish. Mr. Clarke identified it. The species is not included in the 'Vertebrate Fauna of Yorkshire.' It had taken refuge under a Hydrozoa encrusted rock.—J. A. STEVENSON, Scarborough.

**Willow Tit at Scarborough.**—On June 28th, 1926, I found a small bird in my garden in Oak Road, which I took to be a Willow Tit. The secondary feathers in each wing were edged with brown, forming a longitudinal bar along the wing when closed, the flanks were strongly tinged with rufus, and the cap on the head was dull and without gloss on the feathers. The bird had died from apoplexy. I sent the skin to Mr. H. F. Witherby, who has kindly confirmed my identification. I have occasionally found neatly excavated nesting holes in rotten tree stumps in this district which had every appearance of having been dug out by this species, but this is the first specimen I have been able to identify—W. J. CLARKE.

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The Sixty-fifth Annual Meeting of the Yorkshire Naturalists' Union will be held in the Museum, Park Row, Leeds, when the President, Mr. E. Hawkesworth, will take as the subject for his address 'Sixty-five Years of Yorkshire Geology.' We think he should make it sixty-six,

In connection with the Colchester Congress of the South-eastern Union of Scientific Societies has been issued an excellent *Essex Survey*, with map and plates, edited by G. E. Hutchings (133 pp., 3/- net). The handbook contains a series of valuable memoirs on the geology, archæology and natural history of the county, written by experts, and there is also a geological map of the area.

The British Museum (Natural History) is certainly doing its best to popularise the collections under its charge. Its latest effort in this direction is the publication of small four-page 'booklets' in stiff covers which are sold at sixpence each. These contain two pages of letterpress and a coloured plate. So far we have seen those dealing with Fallow Deer, Harvest Mouse, Pine Marten, and Barn Owl.

In *The Evening News* Mr. J. Reid Moir has written a couple of articles on 'East Anglians who were nearly Apes,' which are illustrated by a photograph of Mr. Moir! There is also an illustration of an elephant being shot at by a little army of men, but the size of the elephant is such that their strongest spear does not seem to have reached its head. Assuming that the 'mighty hunters' are only five feet in height, then the elephant from toe to the extended trunk must be forty feet in height. Evidently the extinct 'mighty hunters' are not alone in being able to draw the long bow!

Mr. Cobham has been describing his journey to Australia from the Dutch East Indies, in the press. He says: 'At Bima to-day we saw in captivity two live specimens of prehistoric reptiles that came from the island of Komodo, near Bima, which is the only place in the world where these prehistoric dragons are found. These monsters are identical with legendary dragons. They have huge claws with which they tear their prey to pieces and then swallow it. They catch and devour horses, being eight to ten feet long and when annoyed spit forth vile odours like the legendary dragons.'

## YORKSHIRE NATURALISTS AT CASTLE HOWARD.

F. A. MASON.

THE 328th meeting of the Union was held at Castle Howard during the week-end, June 19th—21st. The district has on a previous occasion received the attention of the Union, when in 1916 a meeting was held at Malton, from which place an excursion to Castle Howard was the programme of one of the days; and no fewer than three Fungus Forays have been held in the same locality. Every lover of Yorkshire scenery is familiar with the extensive and well-wooded parklands, majestic avenues, bracken slopes, and picturesque walls and monuments. Legend has it that three mighty oaks still standing in the park were too old for ship timbers in the days of Sir Francis Drake and the Spanish Armada. The castle itself is well known for its architectural beauty, both inside and out, as are also its art collections of painting and sculpture, and the thanks of the public are due to the present owner for the accessibility which he allows.

Saturday was devoted to an examination of the fish pond and the woods on the estate, a party also visiting the Castle. New ground was broken by a visit to Coneysthorpe Bank Wood, although nothing new or even of outstanding interest was discovered. Excursions to Bell Bottom Wood and Terrington Carrs were also made during the week-end, and with regard to the latter locality, Mr. Burnley contributes an interesting note.

The excursion terminated with a General Meeting held at the Guest House on the estate, under the chairmanship of the President (Mr. E. Hawkesworth), at which reports were rendered by the President, W. G. Bramley, W. J. Forrest, A. Budland, Miss D. Hilary, Greevz Fysher, and F. A. Mason. Hearty votes of thanks were accorded to the Local Secretary (A. J. Burnley), who had been obliged to leave before the meeting, and to Mr. Geoffrey Howard for his permission to visit the estate. Among York members who had been present during the excursions were Sidney H. Smith, W. Bellerby, and A. W. Ping, M.A. (Hon. Secretary, York and District Field Naturalists' Society). The meeting welcomed the presence of a new and active member, Miss Robb, of Thirsk.

FLOWERING PLANTS (Mr. A. J. Burnley) :—Many of the plants named in the circular were not seen, partly because the whole of the area was not worked, and partly on account of the absence of a local guide.

The most interesting plants in the lake were *Villarsia* and the Sweet Flag (*Acorus calamus*). The former, according to records, was introduced by Teesdale, the noted botanist and sometime gardener at Castle Howard, and Baker's 'North Yorkshire' says of the latter that it was found formerly on the banks of the fish pond.

Mr. Mason and the writer paid a brief visit to Terrington Carrs, which botanically proved very interesting. A portion of the carrs had been planted with spruce and Scots pine, many of which have been cut down during the last few years. In consequence there has been a rapid invasion from the adjacent heathery tracts. At present the area that had been cleared is in parts a dense thicket of silver birch. Other young trees were mountain ash and oak. In and near the pools in the peaty soil were *Juncus bulbosus* L., *J. squarrosus* L., *Molinia cærulea* and cross-leaved heather. On the less damp areas were ling, fine-leaved heather, heath bedstraw, hard fern, buckler fern, the lesser winter green (*Pyrola minor*), and the rose-bay willow-herb.

MOSES AND HEPATICS (Mr. W. Bellerby) :—The wall top at the Terrington end of the park was covered with *Bryum capillare* in fine 'fruit'; *Hypnum molluscum* was also found 'fruiting'; *Tortula*

*muralis* and *Barbula rubella*, the latter in beautiful colour and profusion.

In the park quarry the most interesting moss was *Brachyodus trichodes* found on loose stones. On a rotten log *Aulocornium androgynum* was seen. In the woods were *Mnium undulatum*, *M. punctatum*, *Atrichum undulatum*, *Eurhynchium swartzii*, *Hypnum stellatum*.

The following hepatics were the only plants seen, *Aplozia crenulata*, *Lophozia bidentata*, *Pellia epiphylla*, *Conocephala conica* and the ubiquitous *Diplophyllum albicans*.

The month of June is unfavourable at Castle Howard for the investigation of the moss flora, the flowering plants, tall grasses and nettles entirely conceal the smaller plants from observation.

BIRDS AND MAMMALS (W. G. Bramley):—An outstanding feature of bird life at Castle Howard is undoubtedly the Jackdaw, which is to be seen or heard everywhere. With this exception the park, which was the area investigated, proved rather disappointing, especially in the numerical strength of the smaller birds. Chief among these were the Chiffchaff, Garden Warbler and Redstart. Both the Sedge and Reed Warbler were noted, and a nest of the Reed Sparrow seen. On the lake and other sheets of water the Great Crested and Lesser Grebes, Mallard, Coot and Waterhen were seen, and a Kingfisher. The finches were also scarce, but are no doubt more common about the adjacent agricultural land.

A fine Stoat passed the party at a distance of a few feet, and got safely under cover. The Noctule and Pipistrelle were the only bats identified.

MOLLUSCA (Mr. Greevz Fysher):—The weather being on the whole very fine and dry, collecting was mostly from the ponds, but even here, though some of the water contained an unusual number of specimens, the number of species was small.

Among the dry reeds, in a little wilderness to the east of the main drive, notwithstanding the prevailing drought, *H. nemoralis* was abundant, and some material was secured for Capt. Cyril Diver's census of the variation of banding of this species. His list of the varieties is as follows:

'Including adults and young together they are:—

	<i>libellula</i>	<i>rubella</i>	
00000	2	11	
00300	2	6 and 2	} (These eight snails have dotted bands = <i>punctata</i> )
12345	4	6 and 6	
(12)345	0	2	
(12)3(45)	0	1	
12345	0	1	
(123)45	0	1	(this snail is also <i>albolabiata</i> )

Besides ordinary typical *nemoralis*, there are three species of considerable interest, of these I have preserved the bodies to dissect later on. They have the appearance of being intermediate in one or two characters between *hortensis* and *nemoralis*. They are:—

1 small *rubella* 00000 with dark lip

1 small *rubella* 00300 with white lip

(both these snails apparently have *nemoralis* darts).

One small yellow = *lutea*? 00000 *roseolabiata*, which as far as I can see from the dart-sac has a *hortensis* dart.'

The other mollusca from this meeting were submitted to Mr. John W. Taylor, M.Sc., who ascertains the following as taken, some of which are not generally distributed: *Hyalinia cellaria*, *H. nitidula*, *Helix aspersa*, *H. nemoralis* (these shells were obtained from the park and vicinity in a scattered area unsuitable for Captain Diver's census mentioned above, and the varieties observed are included in his list with the

exception of *V. rubella* 19345). *H. arbustorum*, *Spherium corneum*, *S. lacustre*, *Pisidium pusillum*, *P. subtruncatum*, *Succinea elegans*, *S. putris*, *Planorbis vortex*, *P. spirorbis*, *P. carinatus*, *Bithynia tentaculata*.

Mr. Arthur Smith, in the circular, gave a much longer list for the district, but the York Conchologists covered a wide area as far as the River Derwent, and no doubt the records of numerous visits yielded a list not easy to confirm in a single day chosen at random.

ENTOMOLOGY.—Mr. M. L. Thompson reports :—Among a large number of insects met with in Castle Howard Park, and on the roadside in the vicinity, the following may be enumerated

## COLEOPTERA.

*Micropeplus porcatus* Payk.  
*Cateretes rufilabris* Lat.  
*Mycetophagus atomarius* F.  
*Cyphon variabilis* Thumb.  
*C. paykulli* Guér.  
*Hedobia imperialis* L.

*Ochina pinioides* Marsh.  
*Phædon cochlearia* F.  
*Mantura rustica* L.  
*Hippuriphila maduri* L.  
*Apion marshicum* Hbst.  
*Anaspis geoffreyi* Mull.

## HEMIPTERA.

*Lycocoris campestris* Fab.  
*Anthocoris confusus* Reut.  
*A. sylvestris* Linn.  
*Miris holsatus* Fab.  
*M. calcaratus* Fall.  
*Monalocoris filicis* Linn.

*Calocoris striatus* Linn.  
*Lygus pratensis* Fab.  
*L. rubricatus* Fall.  
*Cyllocoris flavonotatus* Boh.  
*Psallus variabilis* Fall.

## HOMOPTERA.

*Athysanus sordidus* Zett.

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## CORRESPONDENCE.

## INTERNATIONAL CODE OF ZOOLOGICAL NOMENCLATURE.

May I state that the Washington Biological Society has just published a reprint at the price of one dollar. Prof. C. W. Stiles, Secretary to the Commission, says: 'I would suggest that, if your colleagues wish copies, it would expedite matters to order a number at once.' The address of the Society is at the Bureau of Entomology, Washington, D.C., U.S.A.—F. A. BATHER.

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The Courtship of British Lycosid Spiders, and its probable significance, appears in the *Proceedings of the Zoological Society of London* for 1926.

The *Proceedings and Reports of the Belfast Natural History and Philosophical Society* just issued contain an excellent Presidential Address by Professor W. B. Morton on 'Lord Kelvin,' who was born in Belfast. Other reports of lectures deal with Christopher Plantin, Printer, of Antwerp; and Spectroscopy and its Application.

The University of Bristol has issued the *Proceedings of the Spelæological Society* for 1925 (pp. 189-315, 3/-). As usual it is well edited and well illustrated and forms a distinct contribution to the fascinating study of prehistoric and other matters: caverns, Bronze Age barrows and Roman sites have been excavated during the year, reports of which are given. Among the many interesting papers may be mentioned 'Frank i' th' Rocks Cave and other Northern Caves in Relation to the Ice Ages,' by L. S. Palmer and L. S. Lee; 'Notes on Upper Palæolithic Implements from some Mendip Caves,' by J. A. Davies; 'Note on a Roman Site at Bedminster Down,' by E. K. Tratman; 'The Upper Palæolithic Age in Britain,' by D. A. E. Garrod; and 'The Study of Flint Flaking,' by S. Hazzledine Warren.

## NEW NATURAL HISTORY BOOKS.

**Wild Life Studies**, by **Frances Pitt**. London: T. Nelson & Sons, Ltd., viii.+189 pp., 2/-. Any publication by our valued contributor, Miss Frances Pitt, is always well worth perusal; and in this case we have pleasure in drawing attention to a well-produced and exceedingly cheap volume, which contains twenty-one essays and a portrait of Gilbert White.

**Myths and Legends of Flowers, Trees, Fruits and Plants in all Ages and in all Climes**, by **Charles M. Skinner**. London: J. B. Lippincott Co., 302 pp., 12/6 net. The author has been to considerable trouble in gathering together a fascinating series of narratives relating to the various stories and accounts of the achievements, medicinal properties and witch-curing capabilities of the different plants of the world. There are several appropriate illustrations.

**In Unknown New Guinea**, by **W. J. V. Saville**. London: Seeley Service & Co., Ltd., 316 pp., 21/-. This is one of a series of charming books on travel which, from the delightful way it is written, and the large series of illustrations, makes its perusal a pleasure, and at the same time gives much information on the ethnology and natural history of a little-understood race. By photographs and excellent sketches a remarkable record is made of the achievements of the Papuans, their social institutions, canoes, wars, feasts, ceremonies and rites, dreams and spirits. Many of the illustrations will be useful to students of prehistoric matters in this country, as they show methods of making primitive boats, pottery, etc., many of which were doubtless on similar lines to those adopted in this country in early times.

**Landmarks in the Struggle between Science and Religion**, by **James Y. Simpson**. London: Hodder & Stoughton, xiii.+288 pp., 7/6 net. In a series of twelve chapters beginning with Religion and Magic; Contributory Elements from Greece and Rome; Cosmogonies Ancient and Modern; Creation, Human and Divine; and ending with Jesus' View of the Universe, the author gives a scholarly volume which may appeal to a certain section of our readers.

**The Case against Evolution**, by **G. B. O'Toole**. London: Macmillan & Co., Ltd., xiv.+408 pp., 7/6. The Professor of Theology and Emeritus Professor of Philosophy at St. Vincent Archabbey has written this volume, which, although only recently published, has already been reprinted. He draws attention to the general reawakening of interest in the problem of evolution as a result of pronouncements made in recent years by Bateson, Wells and Bryan. He discusses the Origin of Life; Origin of the Human Soul; Fossil Pedigrees; Origin of the Human Body and many other similar subjects. He concludes: 'If the foregoing incident conveys any lesson, it is this, that neither singly nor collectively are scientists exempt from error, especially when they deal with a remote past, which no one has observed. The attempt to reconstruct the past by means of inference alone produces, not history, but romance. Doctor Gregory's genealogy of Man displayed in the American Museum is quite as much the fruit of imagination as Jaggar's Kilauean fantasy. The sham pedigree bears like witness to the ingenuity of the human mind, but, if anyone is tempted by its false show of science to take it seriously, let him think of the bombs of Kenakakoe.'

**I Believe in God and in Evolution**, by **W. W. Keen**. London: J. B. Lippincott Co., 109 pp., 5/-. Another aspect of the same question is dealt with by the Professor of Surgery in the Jefferson Medical College, Philadelphia, the title of the book being more or less explanatory. That this book is a 'good seller' is shown by the fact that this is the fourth edition revised and the sixth impression.

**Notes on the Game Birds of Kenya and Uganda**, by **Sir Frederick J. Jackson**. London: Williams & Norgate, xv.+258 pp., 25/- net. In recent years Kenya and Uganda have come prominently to the front,

and quite a number of English visitors are examining that interesting area. Among them many are largely concerned with the natural sciences, and to them and to the student of birds generally, and game birds in particular, we cordially recommend this well printed volume, made additionally valuable by the beautifully coloured plates which adorn its pages.

**A Naturalist's Notebook in China**, by **A. de Carle Sowerby**. Shanghai: North China Daily News & Herald, Ltd., 270 pp., 25/-. While we have many volumes published in recent years relating to the natural history of the less known parts of the world, it rarely happens that anything of a popular nature has appeared relating to China. In the present volume almost every aspect of natural history seems to have been dealt with, though oddly enough the similarity between the fauna of China and that of England is extraordinary, bearing in mind the somewhat unusual aspects of things which occur in that far off country. The illustrations of the mollusca, the insects of various kinds—including our old friend the Death's Head Moth—reptiles, etc., might in many cases have been taken from British specimens. Of course there are forms occurring in China which are unknown to us except in museums, such as, for example, the Giant Spider Crab, the Atlas Moth, etc., but, generally speaking, a perusal of the volume impresses one very much with the fact that from a natural history point of view things in China are very similar to those which exist in our own area.

The Ray Society continues to issue its valuable monographs, and is the means of putting before British workers many useful pieces of information which otherwise would be lost. In the present volume an account is given of the work and achievements of **Wilhelm Hofmeister**, a prominent nineteenth century botanist, who made a distinct impression upon the world in which he lived, by **Dr. K. Von Goebel** (xi.+202+16 pp., 12/6 net).

A welcome addition to John Murray's 'Science for All' Series is **Biology**, by **O. H. Latter** (vii.+197 pp., 3/6). In this excellently illustrated handbook the author gives an admirable introduction to biological science dealing with various aspects of animal and plant life, land and freshwater and marine, the distribution of seeds, plant associations, Mendelism, etc.

**Ice Ages—Recent and Ancient**, by **A. P. Coleman**. London: Macmillan & Co., xliii.+296 pp., 17/-. The excellent work accomplished by the late G. F. Wright, by Warren Upham, P. F. Kendall, and later by W. B. Wright, still leaves room for Professor Coleman's volume, which reviews the evidences of glaciation in Palæozoic and later times, based on field work in Australia, Africa, India, America, etc. He endeavours to give a complete summary of the enormous number of facts at present available in favour of glaciated areas having existed in different geological periods, and in addition to the details which he gives, lengthy lists of books of reference relating to the different chapters add much to the value of the book.

**Our Prehistoric Ancestors**, by **Dorothy Davison**. London: Methuen & Co., Ltd., xiv.+208+8 pp., 7/6. The authoress gives a chatty and possibly useful summary of our knowledge of Prehistoric man, illustrated with sketches of the now very familiar types of human skulls, jaws, etc. It is also embellished with drawings of eoliths, palæoliths, and rock carvings. A list of books is given at the end. By the use of very thick paper this volume does not seem unnecessarily small for the price at which it is published.

**Monograph of the Voles and Lemmings (Microtinæ) Living and Extinct**, by **Martin A. C. Hinton**, Vol. I. London: The British Museum, xvi.+488 pp., 30/-. The British Museum will receive the thanks of all students of fossil mammalia for this excellent volume dealing with a very difficult branch of osteology. Recent researches in

cave and other deposits reveal the fact that the smaller mammals have been much more numerous, both in numbers and in species, than usually supposed, the information being due to careful studies by large numbers of workers, principal among whom is the author of this volume. Each species is dealt with in great detail, biographical information being followed by paragraphs dealing with type, type locality, range, characters, cranial measurements, general remarks, etc. In many instances the county distribution in Great Britain is given, as well as details of the occurrence of the species in different parts of the world.

**The Isle of Man**, by **W. Radcliffe**. London: Methuen & Co., xiv.+208 pp., 6/-. Few areas in the British Isles could be so self-contained as the Isle of Man, and certainly there are not many which have such a fascinating tale to tell. The members of the British Association who recently had an opportunity of spending a week in the island, under the leadership of Mr. Kermodé and Canon Quine, will long remember the many archæological treasures which were unfolded to their view. These and several other interesting features are described, and there is a preface by Sir Hall Caine, who gives the following testimonial: 'I have read Mr. Radcliffe's little book on the Isle of Man, and I think very highly of it. It is a marvel of industry in the accumulation of facts, and of a condensed and lucid statement of them. I doubt if any other book of the kind contains so much material, and I do not think it is likely to be superseded for many years to come. It contains, apparently, the whole of our island story. I try in vain to remember anything of consequence that is not included.'

Geologists throughout the country always look upon the Oxford area as classical, and the Geological Survey has recently issued a new edition of the memoir dealing with that area (**Geology of the Country around Oxford**, viii.+191 pp., 4/- net), under the general supervision of **Mr. John Pringle**, although at the same time a number of other contributors, living and dead, have given their share, namely T. I. Pocock, H. B. Woodward, G. W. Lamplugh, K. S. Sandford, and C. J. Bayzand. As in other recent publications of the Survey, there is a considerable improvement in the general appearance of the volume, the illustrations from half-tone blocks being much better than the old familiar sketches. Mr. Pringle's work in the district, and his familiarity with the principal rocks under review, peculiarly entitles him to have the general editorship of the volume, and we must congratulate him and the Survey on the result.

The Geological Survey of Scotland continues its useful publications on the Economic Geology of the Central Coalfield of Scotland, the second edition of the Fifth Memoir of which has been issued and deals with **Glasgow East, Coatbridge and Airdrie** (x.+171 pp., 5/- net). In this particular publication special reference must be made to the beautiful collotype plates illustrating Carboniferous fossil shells and fossil plants, though unfortunately in our case the anxiety of the Survey to let us have an early review copy has resulted in the binders pressing the plates before they were quite dry, with the result that in addition to the actual plates themselves we have impressions therefrom on the opposite page, though these are slightly marred by the letterpress which protrudes. In a pocket at the end of the volume are excellent details of geological sections, the value of which can only be appreciated by the practical miner and field geologist.

In accordance with the usual practice, the Director of the Geological Survey has produced his **Summary of Progress** for 1925 (vi.+211 pp., 4/6 net), which surely is some indication of the fact that the amount voted for geological research in this country is absurdly small compared with the enormous amount of work accomplished, and its economic value to the State. In addition to detailing the researches of the Survey in different parts of Britain, reporting on the maps which have been issued

and re-surveyed, there is a useful list of monographs prepared during the year by the staff of the Survey. Details of original research in various departments of geological work, also by members of the staff, are given as appendices; in fact, the whole volume has an interest attached to it which obtains on perusing the early volumes of *The Geological Magazine*.

The Avicultural Society has issued a treatise on the management of foreign and British birds in captivity under the title of **Aviculture** (326 pp., 15/-). Many readers of *The Avicultural Magazine* will be familiar with some of the articles and illustrations, but there is no question that in the present form the treatise will be of great value to those interested in aviaries and the breeding of birds. Among the contributors are H. D. Astley, A. G. Butler, A. Decoux, J. Delacour, M. Legendre, E. G. B. Meade-Waldo, G. E. Rattigan, D. Seth-Smith, and W. Shore-Baily, and in addition to numerous excellent illustrations of birds and their nests there are ten coloured plates well illustrating the gorgeous colours of many of the tropical species. The frontispiece consists of a coloured plate of weavers, buntings, and finches.

The Great Western Railway Company has issued an interesting pamphlet **From Cave Man to Roman in Britain**, by **E. J. Burrow** (60 pp., 6d.). It is exceptionally well illustrated, has drawings of caves, earthworks, barrows, cromlechs, and contains a chapter on relics of Roman occupation.

In view of the future of wild fowl in Europe, Mr. P. R. Lowe, of the Department of Birds at the British Museum (Natural History), has issued a useful pamphlet on **The Present Status of the Wild Fowl of Europe** (20 pp.). This has been published by the International Committee for the Protection of Wild Birds (British Section), and gives a useful word of warning with regard to the present rates of destruction of wild fowl.

By the aid of bottles carefully weighted and released at different points, much additional information has been obtained relating to the currents at the bottom of the North Sea (**The Water Movements in the southern North Sea, Part II., The Bottom Currents**, by **J. N. Carruthers**. H.M.S.O., pp. 114, 14/-). By the help of a number of charts, these movements are plotted, and valuable information is given which should be studied by naturalists as well as those interested in the fishing industry.

The Royal Society of London has published an important memoir on **The Cretaceous Plant-bearing Rocks of Western Greenland**, by **A. C. Seward, F.R.S.** Dealing first with the Geology of Greenland generally, with special reference to the localities where fossil plants are being collected, Professor Seward follows with descriptions of the various species found in the Island, compares them with the fossil flora of other regions, and deals with the question of the Cretaceous climate, judging from the information obtained by an examination of the plants.

**The Pediculate Fishes of the Suborder Ceratioidea**, by **C. Tate Regan**. The Danish 'Dana' Expedition. Oceanographical Reports, No. 2. London: Wheldon & Wesley, 45 pp., XIII. Plates, 15/-. In this monograph Mr. Tate Regan illustrates and describes an extraordinary series of deep-sea forms of fish, all of which seem to have curious growths either from the nose or chin. In some instances these resemble brushes or small masses of seaweed, while in others they illustrate forms absolutely like nothing that can be described in ordinary language; in fact, were it not that we know the author personally, and the fact that the 'Dana' Expedition is not subject to joking, we should have assumed that some mentally deranged individual had been sketching objects viewed only as a result of a disordered imagination. One of the species has a long whip-like process protruding from the nose which is about three times its own length. Among the less ferocious looking animals is the *Ceratias holbolli*, which Mr. Tate Regan illustrated in *The Naturalist* for February, 1925, pages 41-42.

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### RIVERS INVESTIGATION.

A meeting of Members and Associates of the Union interested in the above will be held in the Botanical Department of the Leeds University at 19 De Grey Road, on Thursday, November 18th, at 5-30 p.m.

CHRIS. A. CHEETHAM.

---

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Meeting at Meltham on November 20th for the investigation of the moorland areas of the district.

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## NOTES AND COMMENTS.

## THE NORTH-WESTERN NATURALIST.

The papers in *The North-Western Naturalist* for September include 'The Vegetation of Some Welsh Lakes,' by N. Woodhead; 'Cave Exploration in Derbyshire,' by J. W. Jackson; 'Lancashire and Westmorland Diptera,' by F. W. Edwards; and the Rev. E. A. Armstrong reviews the Dean of Chester's essay, 'Expecto.' In this the reverend reviewer concludes 'we are left with the impression that this book can give little pleasure either to the religious thinker or to the scientist who has reverently made the effort to think out the problems of life here and hereafter. The popular mind may demand such books as this, but the mysteries of existence are not to be solved in such a facile way.' But should an article in *The North-Western Naturalist*, occupying pages 134-141, refer to Shropshire naturalists in Devon? Where is 'North-Western'!

## BRYOLOGY OF NEW ZEALAND.

The fourth part of H. N. Dixon's 'Studies in the Bryology of New Zealand' has appeared, and still further orders of these interesting plants have been dealt with in the same bold treatment as was meted out in the previous parts. After carefully examining type gatherings he has been able to reduce, for example, forty species of the genus *Orthotrichum* to eight; twenty different names are now included under *Grimmia apocarpa*, and so on. This shows the thoroughness of Mr. Dixon's work, and in addition there are very helpful keys to the species.—W. H. B.

## THE CONCHOLOGICAL SOCIETY.

The Conchological Society of Great Britain and Ireland held its Jubilee annual meeting at the Leeds City Museum recently. The society arose out of the formation, in 1876, of the Leeds Conchological Club, and in May, 1895, the headquarters of the Society were removed from Leeds to the Manchester Museum. The return in October to the city of its birth was a compliment to its surviving founders, and especially to Mr. J. W. Taylor, who is this year president of the society. Among the representatives of other organisations who attended to offer congratulations to the society were Mr. David Dean, Mr. Charles Oldham, Professor A. E. Boycott, F.R.S., the Rev. C. E. Y. Kendall, Mr. J. R. Welch, Dr. Collinge, Professor Garstang, Mr. E. Hawkesworth, Mr. F. W. Fierke, Mr. C. E. Bromehead, Mr. H. C. Versey and Dr. Tonge. Mr. J. Wilfrid Jackson, the Hon. Secretary, said that through the operations of the society knowledge of the non-marine mollusca in the British Isles was more precise than in any part of the world, and it was probable that British knowledge

of the mollusca of foreign countries was ahead of that possessed by foreign scientists themselves. The President gave an address on 'Mutations in the Mollusca,' and subsequently he entertained a large party to tea at the Metropole Hotel.

#### YORKSHIRE AND SUSSEX.\*

North Geologists will be particularly interested in this volume as it deals with the geological structure of an area which in many ways resembles that of East Yorkshire, though there are important differences which make comparisons all the more interesting. The views of the Chalk Downs and the distant hills, the secondary sandstones, Lower Green Sand and other deposits might almost be matched by similar photographs taken in Yorkshire. On the other hand, the stratigraphy and palæontology of the Wealden beds, Lower Green Sand, the Chalk, and the superficial deposits supply many interesting problems when compared with those in Yorkshire. In addition, the well-known human remains found at Piltdown find a place in this memoir. An excellent map, printed in colours, covering the area described in the memoir, is also published and sold at 2s.

#### THE PUBLIC AND MUSEUMS.

In *The Museums Journal* for October appears Sir Robert Witt's valuable paper on 'The Public and the Museums,' which should be read by everybody interested in the subject. Museums Directors, at any rate, will agree with the following: 'Nor are the salaries paid to Museum officials adequate to their responsibilities, while the opportunities of promotion, and travel, and special study are far too limited. One of the great needs of the Nation is a School, not of bricks and mortar, but of young Museum directors, whose education and experience are such as to qualify them for the posts that offer. If necessary a Diploma or a special course of study should be offered in one of the Universities. On the continent the career is a definitely accepted one, and attracts men of ability, who, though content with the modest pay offered even there, yet realise that variety, opportunity, change and promotion are within their grasp. When Museums are as common as Police Stations, and the staffs as well paid as the constabulary, the great profession of the Museum director and official will have made a substantial advance. It sounds Utopian, but should be universal. Herein the public has its rights and duties. The grants to the Museums come out of its pockets, whether through rates or taxes. It is for those responsible for the administration of the Museums to demand that these grants should be increased, and for the public, for whom I speak, to

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\* 'The Geology of the Country near Lewes,' by H. J. Osborne White. London: H.M. Stationery Office, vi. +97 pp., 2/6 net. Sheet 319.

support them. This support to be effective must be articulate. To make it articulate means increased public interest in the subject. This will come from the inspiration and energy of the Museum authorities. Each body must, therefore, make its contribution to ensure success. Activity, initiative, propaganda, advertisement, cannot fail to win home in the long run.'

#### MAGLEMOSE HARPOONS AGAIN.

The Prehistoric Society of East Anglia for some unexplained reason has suddenly extended the size of its publication to quarto, which makes the housing of the set of volumes in the possession of those who have preserved it, a difficult problem. While there are many illustrations in the part, there is none but could equally well have appeared in an octavo journal. Here again we read that 'Grimes Graves is a thorny problem, and is not a subject for this paper. At any rate the Yorkshire harpoons have demonstrated the existence of the Maglemosean culture in our land.' It seems astonishing that the authenticity of these harpoons can be believed in, after the verdict passed by the Special Committee appointed, that both were made by the *same individual*, putting aside the extraordinary fact that the only two harpoons of the kind found in the country were found by the same individual, within a few months of each other, one in boulder clay at a depth of 14 feet or so, and the other in peat at a depth of 6 feet, at places some miles apart.

#### MORE 'PREHISTORIC' NONSENSE.

*The Daily Express* for October 15th, with eight large headlines, announces 'Prehistoric Faces found in Flint. Men and Women like Dolls. Shingled Girl. Lived Millions of Years Ago. Scientists are completely puzzled by human faces and animal figures which peer out of a series of flints on exhibition at the Psychic Museum, an adjunct of the Psychic Bookshop, run by Sir Arthur Conan Doyle, at Abbey House, Victoria Street. There are forty or fifty of them, none larger than an egg. They were found by Mr. W. H. Clarke, an amateur geologist, who is an official of the Wandsworth Borough Council, embedded [the figures, not the official] in chalk near Brandon, in Suffolk. All of them were at least forty feet beneath the surface, and they represent the laborious search of years. These faces, which Mr. Clarke declares to be tens of thousands of years old, stir the imagination. Some have an evil leer, some are crafty, some are sullen, and all, except one with a freakish resemblance to a modern woman in evening dress, have an elemental and primordial coarseness. Yet they are alive with character and personality.'

## MEN, DUCK, COCKEREL AND SQUIRREL IN FLINT.

A large illustration, three columns wide, showing split flints with the halves corresponding in design and representing human faces, the face of a duck (?), a cockerel, and squirrel clearly demonstrates that these are 'The Sports of Nature, aided by blind chance, rudely to mock the works of toiling man.' In view of the fact that the flints were formed at the bottom of a deep ocean long before either of the animals or human beings represented had made their debut on this globe, it seems a farce that the Daily Press should devote so much space to such utter nonsense.

## A PIGMY RACE.

The article goes on to say 'No psychic influence is suggested, but the mystery deepens even if the markings are assumed to be the work of prehistoric man. How did they come to be embedded in flint? They show up like ghostly white figures projected on a flinty grey background. They are not carved in the flint, for they do not stand out in relief. They are not painted, for the marking goes right through the grain and appears in irregular lines on the outside.' Mr. Clarke puts forward an entrancing theory which explains this difficulty. He contends that the faces, none of which is much larger than a thumb-nail sketch, are the fossilised remains of a pigmy race.

—: o :—

**Euchelia jacobææ in Cumberland.**—On June 14, 1924, I saw numbers of the Cinnabar Moth resting on the Marram grass at the south end of the golf course at Silloth. On June 25th, 1925, I found it plentiful at Beckfoot, and a few days later I saw several near Allonby. About Seascale I have seen the larvæ in hundreds on Ragwort. Away from the coast I have never seen it in this county.—JAS. MURRAY, Gretna.

**Home-bred sinistral *Limnæa peregra* Drap.**—At the request of an old friend I have placed in a local pond a number of young specimens of this mollusc. I have done this entirely against my own principles, being much opposed to any interference with nature by such introductions. For example, in the Scarborough district, *Helix nemoralis*, within twenty miles or more, is limited to the type form and certain varieties, other forms of the species common elsewhere being entirely absent. On the other hand, certain varieties occur here more commonly than elsewhere. Now, should one introduce the absent forms, the local characteristics of the species would be interfered with, and possibly local species or varieties would in time die out or otherwise be lost—W. GYNGELL, Scarborough.

## NOTES ON YORKSHIRE AMMONITES.

DR. L. F. SPATH.

## X.—ON SOME POST-LIASSIC AMMONITES AND A NEW SPECIES OF BONARELLIA.

THE ammonites discussed so far in these notes are all of Lower Liassic age, and they represent the principal portion of Mr. C. Thompson's collection, now in the Hull Museum. The single Middle Liassic form (*Paltoptleuroceras* sp. nov.) listed as new<sup>1</sup> has already been referred to (p. 170) as being a Sinemurian Ammonitid; and the 'new species' of *Harporceras*, *Pseudolioceras* and *Cæloceras*, listed from the Upper Lias, are not, in the writer's opinion, sufficiently definite to be named and described. The Dactyliocerates particularly, with their apparently infinite diversity, are a group to mislead those who are insufficiently acquainted with ammonoid development as a whole. There are already too many of these ammonite 'species.' The collection of the late Mr. James Francis, recently presented to the British Museum, contains a large number of similar Whitby forms of doubtful horizons in the Upper Lias that are probably all referable to known species and their varieties. Now the whole outlook on ammonites has changed, it is not considered advisable to name more of these 'types.' Some authors may disagree, and I am prepared for the usual threadbare arguments to justify the naming of each ammonite individual with a (supposititious) hemera of its own. When the necessary zonal collecting in the Upper Lias has been done it will be found that these numerous names are a hindrance rather than a help. Such Upper Liassic successions as that of Barrington, previously<sup>2</sup> published, are now recognised to be of only very limited value for wider correlations on account of local accidents of collecting, horizontal distribution of species, etc.; in other words, this 'modern' method urgently requires bringing up to date. Attempts at inter-regional correlations of, e.g., Callovian and Albian faunas have shown that it is not even possible to separate similar ammonites like '*Macrocephalites*' on account of their association with an earlier fauna here and a later fauna there, leave alone by mechanical compass and graph methods.

In the present and final instalment we will deal with a few Upper Jurassic and Speeton Clay ammonites in Mr. Thompson's collection and describe a new species from the 'Kellaways' Rock of Scarborough.

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<sup>1</sup> *Quart. Journ. Geol. Soc.*, 1913, p. 181.

<sup>2</sup> *Ibid.*, 1922, pp. 449-50.

The only 'Oxfordian' ammonite sent to the writer is the '*Quenstedtoceras* sp. nov.,' listed by Mr. Thompson (*loc. cit.*, p. 181). It is an old Cretaceous friend, namely *Parahoplites fissicostatus* (Phillips) of the uppermost Speeton Clay (Bed. B., Aptian).<sup>1</sup> Somewhat similar shape and ornamentation were produced already in the Lower Trias (*Anasibirites*), and it is just this continual recurrence of the same types of ornamentation<sup>2</sup> in different offshoots of the persisting smooth stocks that led Steinmann<sup>3</sup> to bring forward his untenable theory of 'race-persistence.' No one nowadays could maintain that the Triassic *Sibirites* is connected with the Jurassic *Zigzagiceras* and *Parkinsonia*,<sup>4</sup> or that *Cladiscites* continued with but slight modification in the uppermost Cretaceous *Parapachydiscus*; but some palæontologists still seem to share Steinmann's<sup>5</sup> belief that if *Pseudoceratites* really represented reduced stocks (*i.e.*, were not direct descendants of the Triassic *Ceratites* as he claims), their ontogenetic development should reveal the process of gradual reduction from normal ammonites. Unlike his disciples, less conversant with Ammonoids as a whole than he, Hyatt even in the early days of his 'Genesis of the Arietidæ' would never have claimed so much for 'recapitulation.'

Of the interesting Kimmeridgian forms, those listed by Mr. Thompson as *Perisphinctes* (?) *quenstedti* (Rouillier) and *P.* (?) *stschurovskii* Michalski, are probably crushed *Pseudovirgatites* of the *palmatum* zone<sup>6</sup> of the Upper Kimmeridgian, corresponding to the Oil Shales of Dorset and the Cemetery ('*Pectinatites*') Beds of Swindon in Wilts. This fauna is almost world-wide, but there are local peculiarities and various zoological provinces.

The next higher *Palassiceras-Virgatites* fauna has not yet been found in Yorkshire, nor the succeeding (Portlandian) true *Craspedites*.<sup>7</sup> The small fragmentary example recorded by Mr. Thompson (p. 182) as '*Craspedites fragilis* Trautschold sp.,' is probably comparable to those small forms of *Dichotomites* previously<sup>8</sup> listed from bed D<sub>10</sub> of the Lower Neocomian of Speeton.

Mr. Thompson's '*Perisphinctes lacertosus*,' Dumortier and

<sup>1</sup> See Spath, *Geol. Mag.*, 1924, p. 78.

<sup>2</sup> See 'Notes on Ammonites,' *Geol. Mag.*, 1919, p. 33, etc.

<sup>3</sup> 'Über Rassenpersistenz bei Ammoniten,' *Centralbl. f. Min.*, etc., 1919, p. 193.

<sup>4</sup> See Pompeckj: 'Zur Rassenpersistenz der Ammoniten,' 3. Jahres-Ber., *Niedersächs. Geol. Ver.*, 1910, p. 77.

<sup>5</sup> 'Probleme der Ammoniten Phylogenie,' *Sitz.-Ber. Niederrhein. Ges. Naturk. Bonn.*, 1909, p. 4.

<sup>6</sup> Spath, *Hunterian Mns. Monogr.*, 1925, p. 158.

<sup>7</sup> See *Quart. Journ. Geol. Soc.*, 1923, p. 307.

<sup>8</sup> *Loc. cit.* (*Geol. Mag.*, 1924), p. 75.

Fontannes I have not seen, but it probably belongs to the group of *Subdichotomoceras lamplughii* and *S. speetonense* Spath, from the *eudoxus* zone of the Middle Kimmeridgian.

The new species here figured from the 'Kellaways Rock' of Scarborough may be named:

*Bonarellia subornata* sp. nov.

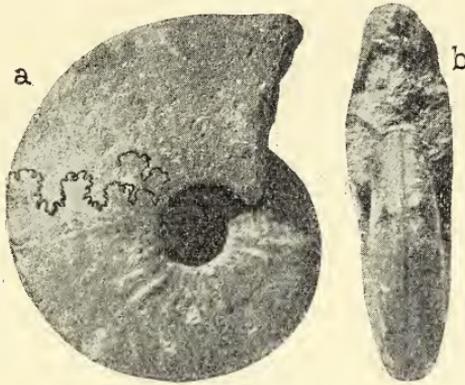


FIG. 15.

*Bonarellia subornata* sp. nov.

Side (*a*) and peripheral (*b*) views of holotype (B.M. No. 39524) from the 'Kellaways Rock' (upper *athleta* zone) of Scarborough.

DIAGNOSIS.—Discoidal, compressed, with small umbilicus, flat sides and blunt keel on a flattened venter. Umbilical wall vertical, with distinct rim; ventro-lateral edges at first rounded, with occasional pairs of tubercles, later with strong clavi, forming two serrated edges on each side of tabulate venter. Anguliradiate ribs (with spiral groove at lateral bend) tending to bifurcate and become indistinct at large diameters. Suture line simple as in other species of *Bonarellia*, with wide lateral lobe.

REMARKS.—This species probably includes '*Distichoceras* n. f. [8] of Parona and Bonarelli<sup>1</sup> (= *Amm. bipartitus nodulosus*, pars, Quenstedt<sup>2</sup>), and it is distinguished from the restricted *B. nodulosa* (Quenstedt)<sup>3</sup> chiefly by its considerably finer costation and sharp umbilical rim, perhaps also by its wide external saddle. *Amm. calcar* Zieten, the type of which

<sup>1</sup> 'Callovien Chanaz,' *Mém. Acad. Savoie.*, 4th Ser., Vol. VI. (1897), p. 140.

<sup>2</sup> *Loc. cit.* (1887), Pl. LXXXV., fig. 11 only.

<sup>3</sup> *Ibid.*, fig 9 only.

(B.M. No. 37670) was refigured by Crick,<sup>1</sup> may possibly represent a malformation of the present species.

The true *Bonarellia bicostata* (Stahl), which is identical with Zieten's *Amm. bipartitus*, is easily distinguished by the regular tuberculation, at the ventro-lateral edges, of each successive pair of crescent-shaped outer ribs. The outer whorls of all these species of *Bonarellia*, however, are similar. A fuller discussion of the Bonarellids will appear in part 2 of the writer's 'Revision of the Jurassic Cephalopoda of Kachh (Pal. Indica).

The figured example is preserved in the brown sandy matrix with green oolitic grains that also characterises numerous examples of *Kosmoceras* as well as *Peltoceras athleta* (Phillips) on the one hand and *Quenstedtoceras lamberti* (J. Sowerby) on the other. This is the 'Irony Sandstone' of the *athleta* and *lamberti* zones, and the ammonites are essentially the same as in the Oxford Clay of the southern counties (Brinckmann's 'Becken-facies<sup>2</sup>'). A number of Scarborough specimens of *Bonarellia bicostata* in the British Museum are preserved in the grey limestone of the upper *lamberti* and *mariae* zones, but no *Bonarellia* has yet been found in the *precordatum* zone. On the other hand, in Mediterranean deposits the genus occurs already with *Macrocephalites* in the *anceps* zone, but at Weymouth *Bonarellia* also seems restricted to the higher *lamberti* zone, although the *athleta* and *anceps* beds are well developed there. The former especially yields gigantic species of *Collotia* and *Peltoceras* to be described with examples and allies from the *fraasi* zone of Kachh, and since recent writers have put forward schemes that are either too local and based on incomplete knowledge of the ranges (elsewhere) of even common forms, and, therefore, of no value for wider correlation, it may be useful to give a revised table of zones for the Callovian and Divesian, showing the equivalents of the Yorkshire succession:—

TABLE OF ZONES.						
Stages.	Ages.	Zones.	Synonyms.	Yorkshire Equivalents.		
Argovian	{ Cardioceran ( <i>cordatus</i> zone, s. l.)	{ precordatus	{ <i>scarburgense</i> , <i>vernoni</i> ,	'Oxford Clay'		
			{ <i>oculatus</i> , <i>renggeri</i> , pars.			
Divesian	{ Quenstedtoceran ( <i>lamberti</i> zone, s. l.)	{ <i>mariae</i>	{ <i>vertummus</i> , <i>renggeri</i> , ,,	} Grey Limestones		
			{ <i>lamberti</i>		{ <i>lalandei</i> , <i>bicostata</i>	
			{ Kosmoceran ( <i>athleta</i> zone, s. l.)	{ <i>duncani</i>	{ <i>proniae</i> , <i>athleta</i>	} Irony Sandstones
					{ <i>fraasi</i>	
Callovian	{ Reineckeian ( <i>anceps</i> zone, s. l.)	{ <i>anceps</i>	{ <i>guelmi</i> , <i>calloviense</i> ,	} Kellaways Rock s.s.		
			{ <i>rehmanni</i>		{ <i>Konigi</i> , <i>tumidus</i>	
			{ Macrocephalitan ( <i>macrocephalus</i> zone, p.p.)	{ <i>dimerus</i>	{ <i>macrocephalus</i> $\beta$	} Cornbrash
					{ <i>compressus</i>	

<sup>1</sup> *Geol. Mag.*, 1899, p. 555, fig. 1.

<sup>2</sup> *Nachr. Ges. Wiss. Göttingen*, 1925, p. 208.

Subdivision of these zones into local 'smaller horizons' is possible where they are exceptionally thickly developed, but I am now driven to the conclusion that we have greatly over-rated the value of this recent 'stratigraphical refinement,' and must also return to a more reasonable, *i.e.*, wider, interpretation of species. Detailed collecting in the beds of the Yorkshire 'Kellaways Rock,' although probably not an easy task, as Mr. Stather<sup>1</sup> has pointed out, will show that many of the supposed lacunæ exist only if we base our succession on the incomprehensible lists of hemeræ recently put forward by Mr. Buckman<sup>2</sup>. Also a new name like Castle Hill Beds or Hackness Rock might be used for this formation, since the proposal to misspell the name 'Kelloway Rock' to indicate its distinctness from the true Kellaways Rock of Wiltshire can scarcely be taken seriously.

In conclusion I may figure a remarkable ammonite, although not a Yorkshire specimen, because it shows the

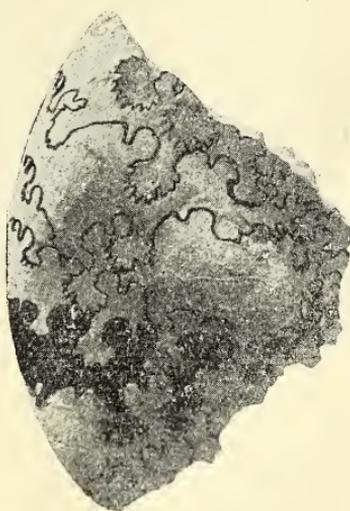


FIG. 16.

*Knemiceras* sp.

Middle Albian of Hamiran, South Persia (F. D. S. Richardson Collection). Showing remarkable changes in the elements of successive suture-lines owing to prominent tuberculation.

<sup>1</sup> *Quart. Journ. Geol. Soc.*, Vol. LXIX. (1913), p. 167.

<sup>2</sup> *Type Ammonites*, Vol. V., pp. 72-3 (1925). To recall the three zones already referred to (on p. 268), I may mention that his *athleta* hemera is in the *fraasi*, his *guelmi*  $\eta$  in the *anceps*, and his *Pleurocephalites*  $\eta$  in the *rehmanni* zone of the above table! Having misinterpreted the Reineckeian age, Mr. Buckman is now (*T. A.*, Vol. VI., 1926, p. 23) forced to explain away the disappearance of Kosmoceratids during a whole imaginary age.

futility of another complication introduced into the study of ammonites, namely, the measurement of the proportions of a given suture-line. The fragment here figured is one of a very fine collection of Pseudoceratites from the Middle Albian of Persia, just received through the kindness of Mr. F. D. S. Richardson, F.G.S., and the Directors of the Anglo-Persian Oil Co. Its interest in connection with the correlation of faunas of different zoological provinces in which the long-lived Engonoceratids abound, will be discussed elsewhere, but for the present it may suffice to illustrate what has been insisted on by the writer on various occasions, *i.e.*, that in the ephemeral, trachyostracous offshoots the suture-line may be as variable as whorl-shape and ornamentation. In other words, a more comprehensive interpretation of species is desirable from the palæontological as much as from the stratigraphical point of view.

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The Merseyside Aquarium Society has been founded with Professor James Johnstone as President, and Mr. F. Jefferies, 18 Massey Park, Wallasey, Cheshire, as Secretary, who would no doubt be pleased to give information relating to the society and the scope of its work.

We learn from *Type Ammonites*, VI., Part LVIII., that 'during the last two years the trivial name *pringlei* has been applied independently by three different authors to three different Ammonoids of the Portlandian-Kimmeridgian deposits.' [*Wheatleyites pringlei* Pruvost, *Shotoverites pringlei* S. Buckman, and *Pallasicerias pringlei* Neaverson]. This naturally reminds us of 'Pallas, take away thine owl, and let us have a lark, instead.'

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The Ministry of Agriculture and Fisheries has published a valuable **Memoir on Plaice-Egg Production in 1920-21, treated as a Statistical Problem, with Comparison between the Data from 1911, 1914, and 1921**, by H. J. Buchanan-Wollaston. This forms Series II., Vol. IX., No. 2 of the 'Fishery Investigation' (36 pp., 11 charts, 8/6 net.). We cannot too forcibly draw the attention of naturalists, and more particularly to those interested in the economic side of our fisheries, to the importance of these memoirs, which have been prepared with extraordinary ability by the members of the staff.

**The Plant Lice or Aphididæ of Great Britain**, by F. V. Theobald. Headley Brothers, Invicta Press, Ashford, Kent, ix.+372 pp., 25/-. In view of the growing economic importance of parasites on plants, and the extraordinary harm that can be done by the sudden appearance of enormous numbers of Aphides, the author of this work has conferred a great boon upon horticulturalists and naturalists alike in bringing together the details of the structure and life history of this queer group of animals. The present volume is one of three to be issued on the subject, and deals with a systematic aspect of the Aphididæ. Three forms of females occur in the majority of Aphides, (1) an alate viviparous female, (2) an apterous viviparous female, and (3) an apterous oviparous female. The males may either be winged or wingless. The apterous viviparous females are really of two kinds, (1) the Fundatrix or 'Stem Mother,' and (2) the progeny or 'Virgogenia.' Representations of these in the various species, with numerous photographic and other illustrations, occur throughout the volume, with particulars of the food plants, localities, etc.

## THE SKOMER MOLE.

FRANCES PITT.

WHEN on Skomer Island in June, 1925, I captured alive six specimens of the bank vole, *Evotomys skomerensis* Barrett-Hamilton, which is peculiar to this small island off the Welsh coast. This mouse was first recognised as distinct from the common vole of the mainland by Mr. Robert Drane, who caught a number, including five live ones, when on the island in June, 1897, but the authorities would not accept it as a new species at that date, failing to recognise the importance of the material he submitted to them. It was reserved for Major Barrett-Hamilton, in 1906, to name this vole, and

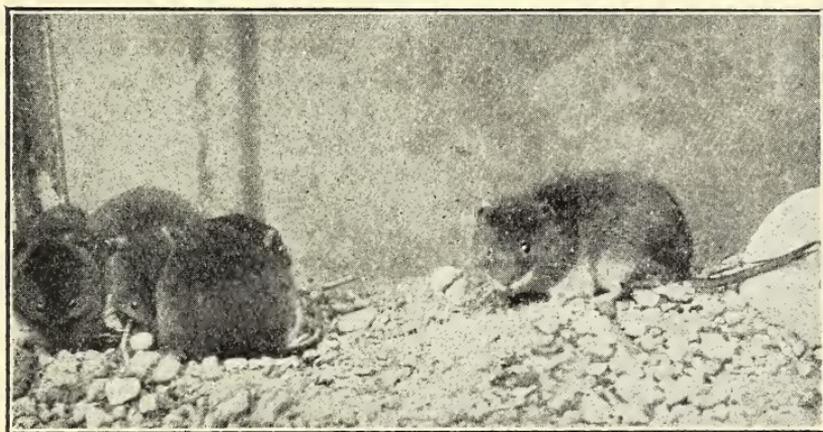


Photo by

Skomer Bank Voles.

F. Pitt

show that it not only differs from *E. glareolus britannicus*, but is derived from a different stock, of which the modern representatives in Great Britain are *E. casarius* of Jersey, *E. alstoni* from the Island of Mull, and *E. erica* of Raasay. They are large mice compared with *glareolus*, and apparently represent a more primitive type, for they occur in isolated colonies on islands where they are safe from competition. Barrett-Hamilton says (*History of British Mammals*, p. 421) 'that the palæontological evidence and the character of *skomerensis* indicate that the latter is a somewhat modified survivor from an older fauna, which has been driven out by the newer and more recent arrival, *glareolus*.'

In appearance *E. skomerensis* is a large and handsome vole, being brighter and lighter in colour than our familiar bank vole. Its large massive skull, and the complicated character of its  $M^3$  are the more stable differences which distinguish it from *E. glareolus*. Were these the characters that reduced it from the status of a widely distributed species

to that of a remnant confined to one small island of but 900 acres in extent?

This was the problem that interested me when I visited Skomer in the autumn of 1924, and again in the summer of 1926. Mr. Drane had taken a few mice alive, which he kept, and they bred. Dr. G. H. Mills had subsequently caught some bank voles on Skomer. Dr. Simpson had also trapped a few, and in 1924 Mr. J. L. Auden spent a fortnight on the island when he got a good series of skins; but light was still wanted on the habits of the species, for, though its physiology had been described, its psychology had been ignored. No one could say if it was a wary species, or an unwary, or whether it differed in behaviour from *glareolus*.

Before giving my observations on this vole, it may be as well to describe its limited territory. Skomer lies off the Pembrokeshire coast of Wales, being divided from the mainland by a narrow sound, the fierce tidal currents of which make crossing difficult in bad weather. The island, which is more or less flat-topped, has precipitous cliffs, the home of countless seabirds, and presents a formidable appearance from the sea. The top, however, is not only fairly flat, but is fertile, and was formerly cultivated. Now, however, it has run wild again, being covered with bracken, nettles, and sheets of bluebells, heather in places, and good grass in other parts. Blackberry bushes, and in one spot a blackthorn bush, are the nearest approach to timber that the island possesses. There are several little streamlets, and a pond, about which the vegetation is rank and luxuriant.

The wild mammalian fauna of the island consists of rabbits in large numbers, the long-tailed mouse, *Apodemus sylvaticus*, the common shrew, *Sorex araneus*, and, of course, the Skomer bank vole. The bird population in the nesting season is terrific. There are huge numbers of puffins, and a great many Manx shearwaters, but the latter, being nocturnal in their habits, and spending the day in their nesting burrows, are not noticeable. The cliff birds consist of kittiwakes, razorbills, and guillemots, all in considerable strength, the first named being most numerous. There are large number of lesser black-backed and herring gulls, which nest on the south-eastern corner of the island, to say nothing of the great black-backed gulls, of which there are a good many pairs. Oyster catchers abound, and there is a fair population of small birds, warblers, finches, blackbirds, and so on. Predatory birds are represented by two or three pairs of buzzards, ditto of kestrels, visiting sparrowhawks from the mainland, a golden eagle (a fine male that has lived on the island for many years, having been originally an escape from captivity, though now as wild as the wildest), many

carrion crows, jackdaws, a raven family, and owls. I picked up a feather that appeared to belong to the short-eared owl, and had a glimpse of a little owl.

From this it will be seen that the small mammals of Skomer have plenty of foes to keep their numbers in check, the kestrels and the buzzards being probably the most effective of their enemies. A buzzard, or a kestrel, was always to be seen, sweeping in wide circles above the rocks, or hovering as a dark speck against the blue sky. In fact, my impression was that natural foes were more in evidence on the island than they are on a similar 900 acres of mainland. Yet, as already stated, the small mammal population is considerable in point of numbers if not in species.

On my first visit to Skomer, a mere flying one of three days, I trapped chiefly around the house—there is but one dwelling on the island, formerly the farmhouse, and now inhabited by the owner, Mr. Sturt, his wife, and daughter, who constitute the entire human population—and beneath the blackberry bushes in the little valley near it. My 'bag' consisted of five specimens of *skomerensis*, two adult males, two adult females, and one immature female. Traps in the buildings were not successful, though the dog hunted out and killed a bank vole from among some rubbish in the corner of a shed—it was an old male. Previous visitors had found the voles in the buildings, and Mrs. Sturt assured me they often came into the kitchen and the back portion of the house.

In 1925 I captured eleven specimens of *skomerensis*, in addition to seven long-tailed mice, *A. sylvaticus*, and eight shrews, *S. araneus*. This does not represent the relative numerical strength of the three species, for I was using a number of 'catch-'em-alive' traps, from which shrews could escape, and did escape, quite easily. As for the long-tailed mice, I released a good many from the 'live' traps. The true proportion of the three, was the common shrew first, about twice as common as the others, next the long-tail mouse, and lastly the bank vole. In all cases cheese proved the best bait, and I found that the best trapping places were near the tiny streams, of which the island can boast two. This confirmed Mr. Auden's observations, for he had also the previous summer found more voles by the streams than elsewhere. They evidently resort to the watercourses for the rich grass and bluebell shoots. There was plenty of evidence that they were very fond of the flower buds of the bluebells.

My notes regarding the voles taken alive, made at the time they were captured, run as follows:—

' May 26th.—Had two *skomerensis* alive this morning.'

' May 29th.—The two voles are all right so far. They

eat a lot of green food, more after the manner of meadow voles (*microtus*) than bank voles, nor are they so fond of dry food as the British bank vole. They have, however, sampled cheese, bread, biscuit and cake, but they have eaten more dandelion leaves than anything else.'

' May 31st.—Have caught two more voles, and put them in with the first couple—a furious battle is now raging! They are squeaking, fighting, and grinding their teeth at each other. One of the first comers (a ♂?) is attacking both the recent arrivals, squeaking furiously all the while.'

' June 1st.—Two more voles, and have turned them in with the others—result, a merry fight.'

' June 2nd.—All six voles quite friendly and lying together in one nest.'

I got the six voles home safely, and not having cages to divide them, put the half dozen together in one fair-sized cage. They were very amusing to watch, sleeping in a heap, and lying one on the top of the other like little pigs. They got on fairly well together, though fresh food would start them 'scrapping,' when much squeaking, boxing, and chasing took place. It was very funny to see them standing up to each other, swearing furiously, so that their squeaky chatter could be heard all over the room, and hitting out like lightning with their forepaws. Their little handlike feet moved so rapidly that the eye could hardly follow them. As a rule these combats only served to cheer life up for the mice, no harm being done, but one morning I found a male with a bite in its flank, so immediately broke up the party, putting two pairs of Skomer voles in separate cages, and giving the two other Skomer mice common bank voles as companions.

I must here say that my hope of crossing *skomerensis* and *britannicus* was not realised, but I was enabled to draw some interesting comparisons between the two species. The difference in life is more marked than when skins are compared. Our common bank vole appears small, lean, keen, and dark beside *skomerensis*. The Skomer vole is bigger, brighter in colour, and of a more yellow-brown-red tint, besides which it has a more portly figure, and is not so alert looking. They differ markedly in disposition. *Britannicus* is shy and very nervous, which makes it difficult to handle. The Skomer vole is placid and docile. Any one of the six would let me pick it up and put it on my arm, when it did not seem frightened or even disturbed. A common bank vole, under the same circumstances, would have jumped 'to Jericho.' The impression that the behaviour of the Skomer voles gave me was that they were mice that would fail in the struggle for existence if they came into direct competition with a more alert species. *Skomerensis* has the characteristics of a

species that finds life fairly easy. This, it must be remembered, is in agreement with the palæontological evidence, which shows it belongs to a type that has been largely supplanted by *glareolus*. Nevertheless, *skomerensis* has foes on its island refuge, and plenty of them too, so it is competition between the species, not persecution by predatory birds and beasts that has determined its present status, as a lingering remnant of an older fauna.

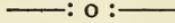
Reverting from generalisations to my half dozen voles—they did well throughout the winter and spring, but did not breed, either with *britannicus*, or together. One or two of them began to look rather old, shabby in the coat, and lacked their early air of prosperity. From observations on other mice and voles, I believe two years among the smaller mammals is equivalent to three score years and ten in the human species, and that two-year-old mice are getting on in life. As these mice were adult when caught the previous May, they must have been born in the summer of 1924. Considering all this, I despaired of getting them to breed, and returned the six to one big cage. Three of the veterans died soon after, but the survivors, two females and a male, seemed to get on better without them! One of the females produced a litter of four young towards the end of June, which were on view by the middle of July. When first seen they were almost half-grown, and duller and darker in hue than their parents. They grew quickly, and were sharp lively young mice, but not nearly so quick as *britannicus*. They are now full-grown, and have begun to moult, their new pelage being as bright and light as that of the adults. They can only be distinguished by their smart sleek appearance. The poor old mice look quite ancient and decrepit by contrast.

The all live together in a common nest, made of nibbled grass fibres, and are a very happy family, save when the old buck chases the youngsters away from the food. They live upon grass, dandelion leaves, and sow thistle, supplemented by grain (such as wheat, oats, and Indian corn), bread, both dry and sopped in milk, and occasionally nuts, acorns, carrot and apple, but grass forms the bulk of their diet.

Like all the bank mice they are dainty little creatures, continually washing and dressing their fur; and they have the usual trait of burying unwanted food, though I greatly doubt these hoards being uncovered save by accident. Altogether they are most interesting and charming mice, and I hope I shall be able to breed more of them.

In conclusion I must emphasize that these observations show that there are other differences, and really more important differences, between *E. glareolus britannicus* and *E. skomerensis* than the outward and obvious physical character-

istics, such as the intangible ones of temperament and alertness, and that it is these latter differences which are probably the ones that have determined that *glareolus* shall be a success in the struggle for existence, while *skomerensis* has become a refugee on a small island.



J. R. le B. Tomlin describes some new species of South African Marine Mollusca in *The Annals of the Natal Museum*, Vol. V., Part III.

A Neolithic adze from Holy Island, Northumberland, is figured in the *Proceedings of the Society of Antiquaries of Newcastle-upon-Tyne*, No. 22.

*The Twentieth Report of the Southport Society of Natural Science* contains reprints of reports of lectures delivered before the society during the session, and the Treasurer's balance sheet shows an amount of £60 in hand. The report is sold at 6d.

C. Cardale Luck occupies an unusually substantial part of *The Journal of the East Africa and Uganda Scientific Society* by a memoir on 'The Origin of the Maasai and kindred African Tribes and of Bornean Tribes.' The illustrations show a distinct similarity between representatives of these tribes and some of the figures shown in ancient Egyptian drawings and carvings.

*The Report of the Council of the Natural History Society of Northumberland, Durham and Newcastle-upon-Tyne* contains the regretfully frequent complaint from the Curator respecting the lack of staff and of funds properly to carry out his work. A perusal of the report will enable anyone desirous of burgling the premises to find the keys which are now all carefully and properly labelled!

Volume XXV., Part III., of the *History of the Berwickshire Naturalists' Club* includes the following: 'Diptera New to the District,' by C. Bolam; 'The Post-Reformation Symbolic Gravestones of Berwickshire' (with many curious illustrations), by J. H. Craw; 'Early Christian Graves at Hoprig,' by G. Taylor; 'The Hawfinch in the Borders,' by Wm. M'Conachie; 'The Mosses and Hepatics of Berwickshire and North Northumberland,' by J. B. Duncan; and 'The Lepidoptera of Northumberland and the Eastern Borders,' by G. Bolam. Mr. J. Bishop's report on the British Association meeting at Southampton is a particularly interesting and human document.

We must congratulate Dr. Allen and the Staff of the Marine Biological Association for the excellence of its *Journal*, Vol. XIV., No. 2. The useful contributions therein are not only of great scientific value, but of much economic importance. There are many illustrations in the form of sketches, diagrams, and photographs. Among the contents we notice 'The Rate of Growth of *Cardium edule*,' by J. H. Orton; 'The Comparative Behaviour of Native Oysters and Portuguese Oysters in Certain Lethal Solutions of T.N.T.,' by J. H. Orton; 'Structure and Physiology of the Organs of Feeding and Digestion in *Ostrea edulis*,' by C. M. Young; 'The Vertical Distribution of Marine Macroplankton,' by F. S. Russell; 'The Precipitation of Calcium and Magnesium from Sea-Water,' by L. Irving; 'The Phosphate Content of Sea-Water in relation to the Growth of Algal Plankton,' by W. R. G. Atkins; 'On *Lumbricillus scoticus*, n. sp.,' by R. Elmhurst and J. Stephenson; 'The Moulting Stages of the Pea Crab (*Pinnotheres pisum*),' by D. Atkins; 'A New Type of Luminescence in Fishes,' by C. F. Hickling; 'Abnormal Vertebræ in Herrings,' by E. Ford and H. O. Bull; 'A General Survey of Larval Euphausiids,' by M. V. Lebour; and 'A New Method for Quantitative Sampling of the Sea-Bottom,' by O. D. Hunt.

## THE COLLEMBOLA OF DERBYSHIRE AND YORKSHIRE.

JAMES M. BROWN, B.S.C., F.L.S., F.E.S.

THE present communication, which is the fourth of the series (previous lists having appeared in *The Naturalist* for 1918, p. 185, 1919, p. 63, and 1923, p. 261), deals with a number of interesting and rarer Collembola which have been obtained largely in North Derbyshire, and chiefly from moss gatherings. Mosses growing on the ground, on old walls, and on tree trunks, form a favourable habitat for some of the more obscure members of the order, preserving these delicate insects from dessication, which is the chief danger they have to contend with. In this habitat many of the smaller and less conspicuous species live in quite large numbers, but owing to their minute size are somewhat difficult to obtain.

Since my last list was published, two species new to science have been described, *Orchesella litoralis* from Yorkshire, and *Isotoma vestita* from Derbyshire, particulars of which are given below.

As in the previous lists the Derbyshire localities are marked \*.

Order : COLLEMBOLA.

Family : PODURIDÆ.

- Xenylla brevicauda* Tullb. occurred plentifully in ground moss, Grindleford.\* So far this is the only Derbyshire record I have, and the species has not yet been taken in Yorkshire, though it has been met with further north.
- X. börneri* Axels. This is one of the smallest members of the genus. The first British record was obtained during the Y.N.U. Meeting at Middleton-in-Teesdale (*Naturalist*, 1925, p. 217). Since then I have obtained it in fair numbers in moss from tree trunks, Hathersage,\* and from ground moss, Coombe's Dale\* (Calver).
- Willemia anophthalma* Börn. This small blind species is very easily overlooked, and is apparently not common. It occurs in the south-west, but has not previously been recorded from the north. I have taken it in ground moss, Monk Wood.\*
- Pseudachorutes asigillatus* Börn. This species occurs most frequently under bark, but is sometimes found in ground moss, Grindleford.\*
- P. subcrassus* Tullb. occurs in moss growing on walls, Baslow,\* and in ground moss, Lathkil Dale.\* In this last locality the species was present in very large numbers, and showed much more of the reddish pigment than usual.
- Friesea mirabilis* (Tullb.) is fairly widely distributed, and can be found under bark and in moss, Wharnccliffe, Lathkil,\* Grindleford,\* Monk Wood.\*
- Onychiurus burmeisteri* Lubb. This seems to be a southern species. It was first described by Lubbock from Kent, and has since been taken in Somerset, Herts., and Warwickshire, this last being the most northerly locality up to date. I obtained several specimens under bark on old palings at Redmires. It is now also known from France and Germany.

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*Tullbergia krausbaueri* (Börn.) occurs in moss, Cordwell,\* Ryecroft Glen\* and Grindleford.\*

Family : ENTOMOBRYIDÆ.

*Anurophorus laricis* Nic. This species has not previously been recorded for Yorkshire, though it has been taken in Derbyshire. It occurred recently in considerable numbers under bark on old larch palings, Redmires.

*Isotoma arborea* (L.) Ågren. bears considerable likeness to *I. cinerea*, but quite typical specimens occurred along with the latter under larch bark, Redmires.

*I. vestita* Brown. This is another of the smaller species inhabiting moss. It was first described from Grindleford\* (*Ann. and Mag. Nat. Hist.*, Vol. XII., p. 325), but has since occurred in moss, Coombe's Dale.\*

*I. notabilis* Schöff. is another species found in moss and among dead leaves, Cordwell,\* Lathkil,\* Coombe's Dale.\*

*Agrenia bidenticulata* (Tullb.) is one of the species more particularly met with in the north. It is found on the surface of the water in upland streams, assembling round the boulders at their margins. It was taken in very large numbers in the Little Don, Hazelhead, during the visit of the Y.N.U. (*Naturalist*, 1923, p. 344).

*Orchesella litoralis* Brown. was described from specimens taken at Runswick Bay (*Ann. and Mag. Nat. Hist.*, Vol. XVI., p. 155) in 1924, and was found again in 1925. It is a maritime species found among the stones just below high-water mark.

*Tomocerus longicornis* (Müll.) is a species very plentiful in the south, but seems to be less common in the north, though taken in Scotland. It occurs in great numbers on the Fells in the Lake District, but has not been noticed in similar situations in Yorkshire. During the Y.N.U. visit to Middleham (Wensley Dale), I obtained numbers on the banks of the River Cover near Middleham, under stones by the stream side.

*Cyphoderus albinos* Nic. is widely distributed, and is found in ants' nests, but does not seem to restrict itself to any one particular species. The only Yorkshire record I have is Hazelhead.

Family : SMINTHURIDÆ.

*Megalothorax minimus* Willem. This minute species is commonly found in humus and among dead leaves. To previous records may be added Cordwell,\* Ryecroft Glen,\* Grindleford.\*

*Smintthurides malmgreni* (Tullb.) var. *elegantula* (Reut.) is an aquatic species found on the surface of pools and slow streams. To the previous localities can be added Beauchief.\* The closely related *S. aquaticus* (Bourl.) seems very rare with us.

*Arrhopalites cæcus* (Tullb.) is another of the small species found in moss, Lathkil Dale.\* The specimens found probably belong to the var. *attenuata* Carp. and Evans, which seems commoner than the type in Britain, and they possessed more pigment than is usual. The species does not appear to be at all common in Britain, though it has been recorded from places as far apart as Scotland and Somerset.

*Smintthurinus aureus* (Lubb.) var. *quadrilineata* (Tullb.) is a very strikingly marked and coloured but small species that occurs sparingly in moss, Lathkil Dale.\*

*Bourletiella hortensis* (Fitch) is a common species in gardens. A specially large form was obtained at Hazelhead. Large numbers of the typical form occurred on the stones and rocks below the cliffs at Runswick Bay. These were probably only casual visitors to the shore from the cliff vegetation, but their occurrence there

is of interest, as they are the only members of the Sminthuridæ that have been recorded from the seashore (*Ann. and Mag. Nat. Hist.*, Vol. XVI., p. 159).

*Allacma fusca* (Linn.). Odd specimens of this large species occasionally turn up, but so far as my experience goes, rather rarely. It is a heavily built insect, and larger than the majority of the Collembola. The last specimen I obtained was, curiously, beaten from a Hawthorn hedge, Hathersage.\* It has not yet been noted from Yorkshire.

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**Cumberland Hepaticæ.**—Supplementary to my note in *The Naturalist* (*ante*, p. 112) are the following:—*Marsupella emarginata*, on soil among rocks in Roughtin Gill, Caldbeck. *Aplozia crenulata*, on a moist bank near Wastwater, and near to this I gathered *Alicularia scalaris*. *Aplozia riparia*, on marshy ground in Roughtin Gill. *Lophocolia bidentata*, common, Abbeytown and near Penrith. *Diplophyllum albicans*, common, Wastwater, Hard Knott, near Ennerdale Lake, on High Pike, and in Roughtin Gill. *Lepidozia trichoclados*, mixed with *Odontoschisma* on Oulton Moss, near Wigton. *Scapania dentata*, on rocks in Roughtin Gill, and on Corney Fell in S.W. Cumberland. *S. undulata* on Corney Fell. *Radula complanata*, on bark of a well-grown Hazel in a wood near Caldbeck. *Frullania tamarisci*, on wet rocks, Carrock Fell. *F. dilatata*, Kelsick, near Wigton, Eskdale, on trees, and on Warnel Fell on stone wall. I have in my herbarium a packet given to me some years ago by the late W. H. Pearson, of Manchester, bearing the following legend '*Marsupella Sullivantii* (De Not.) Evans, Buttermere, coll. W. H. Pearson, April, 1905 (new to Cumberland).'  
—JAS. MURRAY, Greta.

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We see from the *Sunday Observer* of August 29th that the Haslemere Museum 'has long been a model of its kind, and it has been copied all over the world.' We should like to hear of *one* copy!

Under the heading of 'A Fearful Wildfowl,' *Punch* tells us that 'From the village of Tullibody, in Clackmannanshire, comes the story of a sombre-plumaged bird which threatened a baby in its perambulator, and refused to be diverted by "three different varieties of biscuits." A local press report stated that the bird was probably a golden eagle, and that the matter was in the hands of the police. It has not re-appeared.'

Apparently as a result of the inevitable silly-season discussion on toads in stones, which has taken place in a Yorkshire paper recently, there is an illustration of some common liassic fossils headed 'Relics of 36 million Years Ago! Sheffield Lady's Find at Bridport.' A typical *Gryphæa incurva* we are told is a 'mollusc fossil' of the Palæozoic period over 36 million years old at the very least. Another example said to be called *Dima Giganta* is clearly our old friend *Lima gigantea* from the same deposit, but in this case we are told the specimen is of Mesozoic Age of 14 million years ago. After that we are informed that the fossils are to be submitted to the Curator of the local museum, 'and it is probable that he will be able to make some interesting comments about them.' We trust his comments will not be published.

## SCANDINAVIAN BOULDERS IN BRITAIN.

IN the *Geological Magazine* for October, Mr. J. Phemister has a paper on 'The Distribution of Scandinavian Boulders in Britain.' So long ago as 1895 the present writer prepared a list of all the Scandinavian boulders recorded in Great Britain up to that time, which was printed in *The Glacialist's Magazine*. The object of the list was to disprove the theory put forward in *Nature* by the late Sir Henry H. Howorth that all Scandinavian boulders in this country had reached us as anchors and ballast used by the Vikings. Sir Henry admitted he was wrong. Mr. Phemister apparently reprints and amplifies this original list, and takes advantage of the various records published by the East Riding Boulder Committee, the British Association and various individual workers. He concludes: 'The writer is of opinion that the presence of Scandinavian boulders in the Yorkshire boulder clay is insufficient ground for the hypothesis that an ice-sheet, radiating from Scandinavia, has invaded the Yorkshire Coast. The numerical data of the tables show that the Scandinavian rocks constitute a very small percentage of the total far-travelled rocks of the boulder clay, and that the bulk of the far-travelled rocks are Scottish in origin. Additional evidence to the same effect is provided by the existence, in Durham, of a boulder clay of undoubted Scandinavian character, with no Scottish leanings, and by the absence of any similar clay in localities where it might be expected to occur if a general invasion of north-east England by Scandinavian ice had actually taken place. It may be that the boulders of Norwegian rocks have been dropped on the floor of the North Sea by icebergs, and subsequently incorporated in a Scottish ice-sheet; but the writer ventures to suggest for consideration, in this connexion, the hypothesis assumed by B. Milthers to account for the presence of Swedish boulders in East Prussia and western Russia. He says: "Every single place where indicator-boulders of different origin have been found, is indeed a focus of converging directions by which the boulders have come . . . . (that) the ice stream which carried down the Aland boulders to North Germany, by way of the Baltic Basin, received additions from the side from the southern Swedish highlands, and (that) these additions at a later period . . . . constituted an essential portion of the Smaland indicator-boulders contained by the ice-stream. All the discoveries of boulders throughout the whole of East Germany and West Russia bear witness to this lateral addition of Swedish materials to the Baltic stream." A similar hypothesis applied to the British drifts appears to the writer sufficiently to account for the main features of distribution

of Scandinavian boulders in Britain.' Personally, we think that this conclusion might easily have been arrived at without printing the lengthy and unnecessary details in the several pages of tables.—T.S.

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## THE PLUMULAR HOOK IN PLANTS WITH OPPOSITE LEAVES.

PROF. J. H. PRIESTLEY, B.SC.

IN the Presidential Address at Huddersfield, on December 5th, 1925, on page 72 of the published address in *The Naturalist* (March, 1926), the following sentence appears: 'No plants with opposite leaves seem to be recorded as forming a plumular hook, while many, but not all plants with alternate leaves develop it when grown in darkness.' This correlation seemed worth notice in the absence of recorded cases to the contrary. Prof. R. C. McLean, of Cardiff, has, however, drawn my attention to the paper by Dr. E. J. Salisbury in *The Journal of Ecology* (IV., pp. 121-128, 1916), in which the decussate leaved *Mercurialis perennis* is figured, growing in darkness, with a well-marked 'plumular hook' type of curvature near the tip of the shoot. Professor McLean also states that for the demonstration of the plumular hook he has frequently used seedlings of *Euphorbia Lathyris*, another plant with opposite leaves. It would be interesting to know if to these two exceptions to the tentative generalisation that plumular hooks were absent from plants with opposite leaves, the members of the Yorkshire Naturalists' Union can add many more? Two exceptions can probably be studied with profit, but if they are only two of many, the sooner this attempted correlation is forgotten the better. It is easily to be understood from the standpoint from which it was advanced, that similar curvatures are frequent in leaf petioles, with their characteristically dorsi-ventral structure, as they emerge from the darkness of the soil. The numerous cases of recurved axes bearing flower buds remain as evidence that such curvatures are produced in organs with apparently quite radial symmetry. Such developing flower axes it was hoped to examine as the whole problem of their re-erection is of great interest in reference to the phenomena of geotropism and phototropism. The writer would, therefore, be very glad to know whether, during observations of the emergence of seedlings in the spring of 1927, many cases come to light of opposited leaved seedlings with plumular hooks.

## MOLLUSCA FROM ANCIENT EGYPTIAN TOMBS.

AMONG a fine collection of Egyptian antiquities excavated by the British School of Archæology in Egypt, and placed in the Municipal Museums at Hull, is a series of necklaces, many of which are wholly or partly composed of mollusca, principally marine, but occasionally freshwater. With the exception of the latter, which occur in the River Nile, all the species are typical Red Sea forms, many ranging over the Indo-Pacific region. Mr. J. W. Jackson, M.Sc., of the Manchester Museum, has kindly examined the collection on our behalf, and the following is his report thereon:—

## SHELLS FROM EGYPTIAN TOMBS IN HULL MUSEUM.

Identified by J. WILFRID JACKSON.

<i>Location, etc.</i>	<i>Date.</i>	<i>Species.</i>	<i>Present Habitat.</i>
Badari, 3189	VI. Dyn.	<i>Spatha rubens</i> (Lam.)	R. Nile
Qau-el-Kebir, 630	O.K. Dyn.	Do.	Do.
Do. 101	Pre-Dyn.	Do.	Do.
Badari, 5700	Badarian	Do.	Do.
Do. 25/5500	?	<i>Aetheria elliptica</i> (Lam.) <i>Cypræa annulus</i> L. (rub- down on back)	Do. G. of Suez, Red Sea, Ind. Ocean etc.
Qau-el-Kebir, 4/1755	About VI. Dyn.	<i>Clanculus pharaonis</i> L.	G. of Akaba, G. of Suez.
Do. 600	Roman Dyn.	<i>Engina mendicaria</i> L.	G. of Suez, etc., Indo- Pacific.
Badari, 25/5763	Badarian	<i>Natica mamilla</i> L.	G. of Suez, Indo-Pacific
Do. 5733	Do.	<i>Nerita albicilla</i> L.	Do.
Do. 3800	'Pan' Dyn.	<i>Clanculus pharaonis</i> L. <i>Nerita polita</i> L.	G. of Akaba, etc.
Do. 3901	Pre-Dyn.	<i>Trochus</i> sp. indet. <i>Natica mamilla</i> L.	Do. etc. G. of Suez, etc.
Do. 25/5708	Badarian	<i>Nerita polita</i> L.	G. of Akaba, etc.
Do. 24/3742	Pre-Dyn.	<i>Natica</i> cf. <i>melanostoma</i> (also shell-beads)	G. of Suez, etc.
Do. 25/5400	'Pan' Dyn.	<i>Turritella trisulcata</i> Lam. <i>Strombus tricornis</i> Lam. (spire of)	Do. Red Sea
Qau-el-Kebir, 1790	Pre-Dyn.	Five shell-bangles made from large Turbos, prob- ably <i>Turbo petholatus</i> L.	G. of Suez, Indo-Pacific
Badari, 25/5733(2)	Badarian	<i>Natica mamilla</i> L.  <i>Oliva</i> cf. <i>inflata</i> Lam.	G. of Suez, etc. Do.

Location, etc.	Date.	Species.	Present Habitat.
Badari, 24/3900	Pre-Dyn.	<i>Natica mamilla</i> L.	G. of Suez, etc.
		<i>Ancillaria cinnamomea</i> Lam.	Do.
Do. 25/5722	Badarian	Do.	Do.
Do. 25/4717	Do.	<i>Natica</i> sp. indet.	
		<i>Ancillaria cinnamomea</i> Lam.	Do.
Do. 25/5500	'Pan' Dyn.	<i>Conus</i> sp. indet.	
Qau-el-Kebir, 600v	Roman	<i>Cypræa annulus</i> L. (rubbed down on back) and disk made from top of <i>Conus</i> -shell (rubbed down)	Do.
Badari, 25/5700	Badarian	<i>Nerita polita</i> L.	G. of Akaba, etc.
		<i>Ancillaria cinnamomea</i> Lam.	Red Sea, etc.
Do. 25/5733(I)	Badarian	Shell-rings ? made from <i>Dentalium</i>	
Qau-el-Kebir, 965	IX. Dyn.	<i>Cypræa annulus</i> (rubbed down as usual)	G. of Suez, etc.
?	XII. Dyn.	<i>Nassa</i> ( <i>Arcularia</i> ) cf. <i>thersites</i> Brug.	Ind. Ocean, Singapore, etc.
		<i>Engina mendicaria</i> L.	G. of Suez, etc.
		<i>Cypræa</i> cf. <i>helvola</i> L.	Red Sea, etc.
Qau-el-Kebir, 600φ	Roman Dyn.	<i>Nassa</i> ( <i>Arcularia</i> ) cf. <i>thersites</i> Brug.	Ind. Ocean, etc.
Do. 1300/14	Foreign XVI. Dyn.	<i>Nerita polita</i> L.	G. of Akaba, etc.
Do. 600	O.K. Dyn.	<i>Columbella</i> ( <i>Mitrella</i> ) <i>ligula</i> Duclos.	Ind. Ocean
Do. 600	Roman Dyn.	<i>Conus</i> sp. indet.	
Do, 24/363	About VI. Dyn.	<i>Nerita polita</i> L.	G. of Akaba, etc.
		<i>Nassa</i> ( <i>Arcularia</i> ) cf. <i>thersites</i> Brug.	Ind. Ocean, etc.
Do. 943	Do.	<i>Cypræa annulus</i> L. (rubbed down as usual)	G. of Suez, etc.
Do. 833	Do.	<i>Nerita polita</i> L. (and shell-rings)	G. of Akaba, etc.
Qau-el-Kebir, 1307	XVI. Dyn.	<i>Jopas sertum</i> Brug.	G. of Suez, etc.
Do. 100/2	Pre-Dyn.	Shell-bangle, made from large <i>Turbo</i> , probably <i>Turbo petholatus</i> L.	Do.
		<i>Ancillaria cinnamomea</i> Lam.	Red Sea, etc.

Location, etc.	Date.	Species.	Present Habitat.
Qua-el-Kebir, 700 <sup>a</sup>	Ptol. Dyn.	<i>Cypræa annulus</i> L. (rubbed down)	G. of Suez, etc.
		<i>Conus minimus</i> L.	Indo-Pacific
		Pearl-shell-disks	
		<i>Conus</i> -top-disks	
Do.	100	Pre-Dyn.	
		<i>Conus minimus</i> L.	Indo-Pacific
		<i>Ancillaria</i> sp.	
		<i>Nerita</i> sp.	
Badari,	25/5364	?	
		<i>Nerita polita</i> L.	G. of Akaba, etc.
		<i>Ancillaria cinnamomea</i> Lam.	Red Sea, etc.
		<i>Conus minimus</i> L.	Ind. Ocean
		<i>Oliva inflata</i> Lam.	G. of Suez, etc.
		<i>Natica mamilla</i> L.	Do.
		<i>Natica melanostoma</i> Gmel.	Do.
Do.	24/5289	2nd Inter.	
		Do.	Do.
		<i>Nerita polita</i> L.	G. of Akaba, etc.
		<i>Clanculus pharaonis</i> L.	Do.
		<i>Solarium perspectivum</i> L.	Ind. Ocean
Do.	5755	?	
		<i>Conus quercinus</i> Hwass.	Red Sea, etc.
Qau-el-Kebir, 1093	VII. ?		
	Dyn.	<i>Conus minimus</i> L.	Ind. Ocean
Do.	1714	I. Dyn.	
		<i>Conus minimus</i> L.	Do.
		<i>Ancillaria</i> sp. (juvenile)	
		<i>Natica</i> sp. (juvenile)	
Do.	1123	O.K. Dyn.	
		<i>Pectunculus</i> cf. <i>lividus</i> Reeve	Red Sea, etc.
Badari, 5700	Badarian	<i>Mutela</i> cf. <i>dubia</i> (Gmel)	R. Nile

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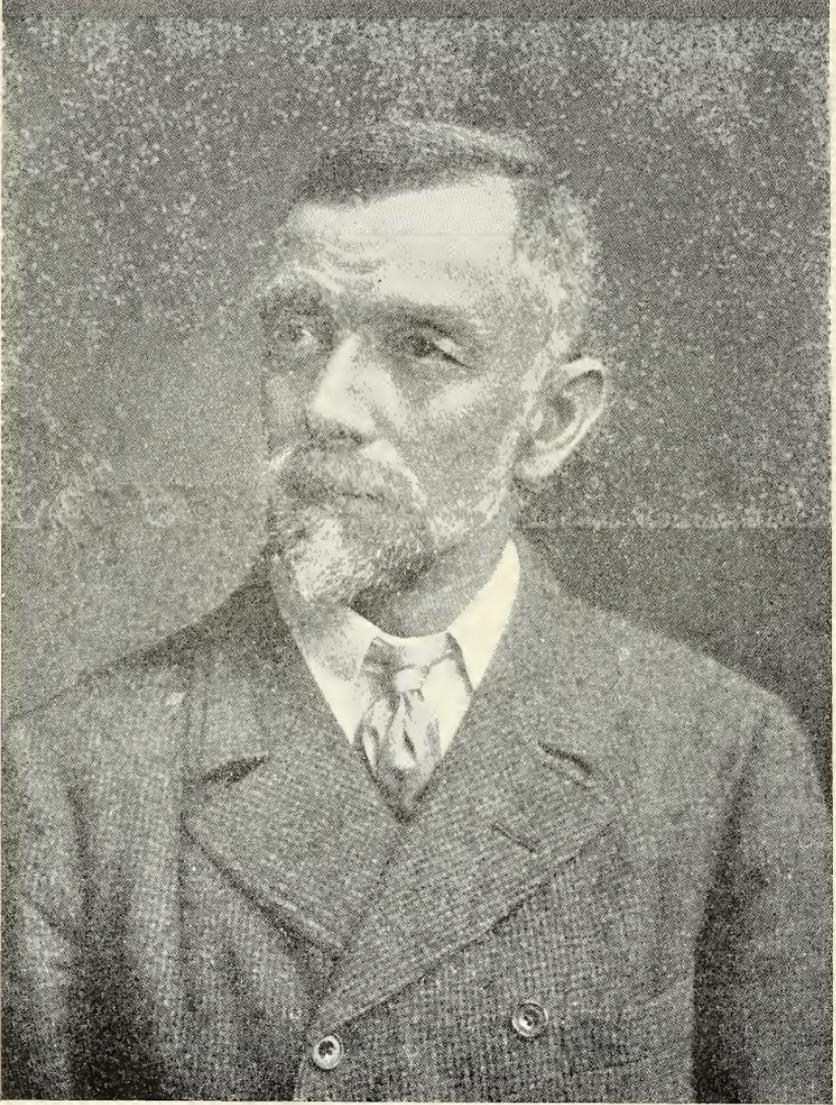
The Woolwich Council of Social Service has issued a circular showing the enormous amount of good work being carried out by that society, largely as a result of the energy of Mr. C. H. Grinling, of 71 Rectory Place, Woolwich, who would be glad to supply particulars of what is being accomplished.

*The Report of the Botanical Society and Exchange Club of the British Isles*, Volume VII., Part V., has been issued, and contains pages 751 to 1027, which include botanical notes relating to all parts of the country and abroad. There are obituaries, notes on publications, plant notes, etc.

*The Botanical Society and Exchange Club* has also issued its *Report for 1925*, by the Editor, H. Downes. This forms Volume, VII., Part VI., contains pages 1029 to 1073, and is sold at 4/-.

In *Type Ammonites*, Part LVIII., is figured '*Caloceras aplanatum*, Hyatt, 1889, Holotype Gen. Ariet. p. 147, f. 23, 24; Whitby, Yorks.; *Jamesoni* Bed *Metechioceras*, Trueman and Williams, 1925; Mus. Cambridge, Mass. S. (cast) 60, 21, 18, 58; 76, 21.5, 17, 62; size c. 80, max.? Cast and photograph sent by Prof. S. Henshaw, METECHIOCERAS APLANATUM, Hyatt, sp. Deroçeratan, *Metechioceras* cf. CDLXXXII.





*Yours Sincerely*  
*J. W. Lamplugh*

## In Memoriam.

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GEORGE WILLIAM LAMPLUGH, F.R.S., F.G.S.

(1859—1926).

FOR over half a century the name of George William Lamplugh has been a household word to readers of this Journal. Not only has he frequently contributed to our pages, but in his capacity as President of the Yorkshire Naturalists' Union, and as leader of excursions on numerous occasions, he has become a friend to an enormous circle of now well-known amateur geologists. He was one of the best examples we remember of an amateur pursuing his hobby, and eventually being able to adopt the hobby as a profession. After joining H.M. Geological Survey, by strenuous work and exceptional ability as a field geologist and writer, he climbed to the top of the ladder, and on his retirement a few years ago, he was the Assistant Director of the Survey, and, I think it is not a secret that had he so wished, he might have occupied the Director's chair.

He was born at Driffield, and as a young man was employed in a merchant's office in Bridlington, and spent his spare time on evenings and holidays in investigating the various drift deposits round the fascinating area of Flamborough Headland, and in working at the puzzling Clay Beds at Speeton.

In 1891 Lamplugh's various contributions to the glacial literature of the district were incorporated in a magnificent memoir 'On the Drifts of Flamborough Headland,' published by the Geological Society of London, and this has been truly described as one of the 'gems of British Glacial literature.' Also in 1889 the same Society published a similarly valuable memoir on the Speeton Clays, where again his extraordinary field knowledge, combined with innumerable visits to that difficult section, enabled him to produce a proper classification, by the aid of the belemnites, which has been the basis for all future work on the subject.

Under his supervision the Pre-glacial Chalk Cliff at Sewerby was investigated by the British Association in 1887, and he was able to demonstrate that since the Great Ice Age no change in the sea level had taken place in that area.

Lamplugh was one of the strongest supporters of the Land Ice theory of the drift deposits, and also strenuously opposed suggestions which were made from time to time that there were two, three, seven or more Ice Ages in England in Quarternary times, maintaining that the whole of the

phenomena could be accounted for on the assumption of one ice cap, the front of which had receded and re-advanced from time to time.

Mr. Lamplugh's knowledge of the palæontology and stratigraphy of the chalk enabled him to prepare a memoir on 'The Chalk of Flamborough Headland,' in which every individual bed was carefully measured and plotted out, and an occasional palæontological note was added. Here again his pioneer work in this direction formed the foundation of all subsequent publications on the subject.

Lamplugh was peculiarly qualified to undertake the Geological Survey of the Isle of Man, and his memoir thereon is of particular importance, as here his acquaintance with the drift enabled him to give a graphic account of the conditions which existed in the Irish Sea during the Great Ice Age. His work there also enabled him to bring before the geological world for the first time the importance and significance of the 'Crush Conglomerates' so well developed there.

In more recent years his services have been of considerable assistance in the preparation, both in the field and in the office, of numerous Geological Survey Memoirs dealing with various parts of England.

In 1918-20 he was President of the Geological Society of London, the blue riband of the geological world, and took for the subject of his address, 'The Structure of the Weald and Analogous Tracts.'

So long ago as 1891 he received the Lyell Fund, and since then he has been awarded the Bigsby Medal and the Wollaston Medal. In 1906 he was President of the Geological Section of the British Association, and he has had a similar position in connexion with the Yorkshire Geological Society, the Hull Geological Society, and the Hertfordshire Natural History Society.

Both in the field and in debate Lamplugh was exceedingly cautious, and never came to a conclusion or expressed an opinion without considering the matter from every possible angle. In this way we find his work always sound and reliable, and an opinion once expressed worthy of every possible respect. The present writer, particularly when he was in his 'teens, was indebted to him for much sound advice given on geological matters.

Lamplugh travelled in all parts of the world, and wrote many papers on the Geology of Africa, Spitzbergen, Australia, Canada, Vancouver, Alaska, etc.

To give a full list of Lamplugh's papers would be rather a serious undertaking, but the perusal of the bibliographies of Yorkshire and of the North of England, published by the

Yorkshire Geological Society, and in *The Naturalist* respectively, will indicate the greater number of his scores of valuable contributions to geological science. There is also a list up to 1917 in *The Geological Magazine* for 1918, in the well-known 'Eminent British Geologists' Series, where also was a portrait and memoir giving an account of his principal achievements up to that time.

So long ago as 1893, when the present writer published his 'Geological Rambles in East Yorkshire,' he had the privilege of dedicating that volume to two outstanding Yorkshire Geologists, one of whom was the subject of this memoir.

We hope to give a portrait next month.—T.S.

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### YORKSHIRE NATURALISTS AT FARNLEY.

ON Saturday, July 17th, the 329th meeting of the Union was held at Otley for the investigation of Farnley Park, Leathley. No meeting had been held at Otley since 1883, and on that occasion the programme did not include a visit to Farnley Park, at any rate for an examination of its flora or fauna, and it seems inexplicable that an area within working distance of the cities of Leeds and Bradford should have remained so little known, particularly with regard to its vegetation. The greatest difficulty was experienced in compiling notes of authentic value for the Excursion Circular, and those relating to the botany of the district, abstracted from a former circular published in 1883, proved to be misleading.

After meeting at the Wharfe Bridge, Otley, the party, piloted by Mr. Riley Fortune, F.Z.S., set off for Farnley Park, where the first specimens of local interest, as detailed in Mr. Booth's report, were waiting in the hands of one of the keepers at the entrance gate. After examining the Park, the Hall was visited, where, by the courtesy of Major F. H. Fawkes, members were allowed to inspect a selection of drawings and paintings from the famous Turner collection. Special attention was bestowed upon the fishpond which had recently been cleared, a misfortune from the naturalists' point of view, as certain plants have apparently disappeared in consequence. *Ranunculus Lingua* is one of these, no specimen of this plant having been seen on this occasion, although it was moderately abundant in the pond a few years ago. After lunch, small parties visited the Washburn, working upstream towards Lindley Wood.

In the evening a General Meeting was held at Leathley, where the President (Mr. E. Hawkesworth) occupied the chair. Reports on the work of the day were rendered by Messrs. Malin Smith, M.A., W. H. Burrell, H. B. Booth, Greevz Fysher, W. Grace, B.Sc., and W. P. Winter, B.Sc. A vote of thanks was accorded to Major Fawkes for his permission to visit the Hall, Park, and other parts of his estate. It was known that the Local Secretary, Mr. Riley Fortune, had suffered a recent bereavement, and that his presence in the capacity of leader was at much personal inconvenience, and a vote of sympathy and of thanks was accorded with much appreciation of his services.

VERTEBRATE ZOOLOGY (Mr. H. B. Booth) :—A very pleasant day was passed amid beautiful surroundings by the goodly company of ornithologists present. Although at a very quiet time of the year for birds, a considerable number was observed. An exception was in water-birds,

and on the fishpond in Farnley Park, to our surprise, not a single duck of any species was seen. Among water-birds a pair of Little Grebes, a Coot with a single chick, and a few Waterhens only were seen. But around the same pond were warblers, etc., of many species, and in some numbers. Several pairs of Sedge Warblers were much in evidence. This species is rare and local elsewhere in Upper Wharfedale, but I saw as many Sedge Warblers around the fishpond at Farnley that day as I have seen elsewhere in Upper Wharfedale in all my life. Several family parties of Bullfinches were heard and seen. The Greater Spotted Woodpecker was seen near to the fishpond, and also a mile and a half away in the Washburn Valley. Other species included the Dipper, Goldcrest, Garden Warbler, Grey and Yellow Wagtails, and a single Common Sandpiper. Being rather late in the season, the only nests seen were those of a Common Whitethroat with three fresh eggs, and a Willow Warbler with young ones.

In mammals the recent 'spoor' of an Otter occurred at the fishpond. Several members of the party were curious to know if the Badgers had survived the continual and concentrated bombing practice which took place in the park during the Great War, or whether they had 'taken up their beds and walked' elsewhere? Major F. H. Fawkes has since kindly informed me that Badgers still inhabit Lindley Wood, Stainburn Ghyll and the Lake Plantation. He also volunteered the information that vixen Badgers there usually had litters of five cubs—which seems to be an excessive number.

In Pisces, of course, Trout were frequently seen, but the surprise of the day in the Zoological Section was in a fish. The lodge-keeper met us at the gate with a freshly killed female Eel, which we measured at just short of 40 inches, and guessed to be about 3 lbs. in weight. It had been taken when the drinking-water reservoir of the hall was being cleaned out. It was in the silvery-white condition for migration, and had, no doubt, been imprisoned for several years in this reservoir, from which it could not escape for migration, thus accounting for its size and weight. It was at the least three times larger and heavier than any other Eel that I have seen in Upper Wharfedale—where Eels are usually small.

BOTANY (Mr. A. Malins Smith, M.A.) :—The visit was of great interest to botanists, who saw, in addition to the usual flora of woodland and grassland in this Millstone Grit area, an aquatic flora which reached a high state of development in the fishpond at Farnley Hall. In the pond were the following floating and submerged species: *Polygonum amphibium*, *Ranunculus peltatus*, *Potamogeton natans*, *P. obtusifolius*, *Myriophyllum spicatum* and *Lemna trisulca*. *Polygonum amphibium* in full flower was dominant over great parts of the pond and furnished a very fine spectacle. In addition, *Galium palustre* was found completely submerged, as it not infrequently is in suitable situations.

Towards the lower end of the pond a reed-swamp was developed, but not very extensively. The chief species were *Sparganium ramosum*, *Iris pseudacorus*, *Typha latifolia*, and in one area *Acorus calamus*. The last is undoubtedly an introduced plant here, and its flowerless condition is probably due to its being so far north. Among the taller plants, and to some extent sheltered by them, were *Alisma plantago*, *Scutellaria galericulata*, *Veronica scutellata*, *Ranunculus Flammula*, *Galium palustre*, *Lotus uliginosus*, and, on the somewhat drier margins, *Galeopsis tetrahit*, *Hypericum tetrapterum* and *Carex paniculata*. In addition to the foregoing, smaller ponds furnished *Eleocharis palustris*, one stem of which measured 38 ins. long, *Lythrum Salicaria* and *Carex ampullacea*.

The visit to Lindley Wood provided the usual flora of the oakwoods of the neighbourhood, with birch becoming an important constituent in the drier parts. Honeysuckle was a common undershrub. The usual ground vegetation, dominated by the Bluebell-Bracken and Holcus

association, was present with other typical members of this association, such as *Teucrium scorodonia*, *Scabiosa succisa*, *Solidago Virg-aurea*, *Hypericum pulchrum* and *Campanula latifolia*, this last being particularly abundant and finely developed in various places. The grassy slopes yielded *Stachys betonica* and *Euphrasia officinalis* in abundance, and a specimen of *Ophioglossum vulgatum* was obtained. A more open association occurred near the dam of Lindley reservoir. Here on a steep slope, presumably somewhat recently denuded in connection with the erection of the dam, was a much more varied flora than in the woodland itself, comprising, besides such woodland species as *Teucrium scorodonia*, *Holcus mollis*, *Fragaria vesca*, and *Solidago Virg-aurea*, the following more casual plants: *Geranium dissectum*, *Sherardia arvensis*, *Alchemilla arvensis*, *Senecio Jacobæa*, *Erythrea centaurium*, *Linum catharticum*, *Hypericum humifusum*, *Gnaphalium sylvaticum*, *Polygala vulgaris* and *Veronica officinalis*. The presence of some of these, e.g., *Linum catharticum*, points to somewhat less acid conditions than usual in such an area, and a sample of the soil on which *Linum* was growing, tested later in the laboratory, gave a  $P_H$  of 6.9, which is distinctly high for a soil in the gritstone area. Other plants which may be mentioned among the day's finds are *Polygonum Persicaria*, *P. Hydro Piper*, *Malva moschata*, *Ononis arvensis*, *Trifolium medium*, *Montia fontana*, *Geranium pratense*, *Hydrocotyle vulgaris* (in flower) and *Carex remota*.

Of particular interest was the presence of *Sparganium* in a mill-stream with fairly swift current. In these conditions the plant was small, completely submerged, with ribbon-like leaves extending almost horizontally with the flowing water. This state provides a great contrast with the much more massive and erect form normally assumed by the plant.

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## YORKSHIRE BOTANISTS AT LEEDS.

THE Botanical Section of the Yorkshire Naturalists' Union was again indebted to Prof. Priestley for an invitation to meet in the Botanical Department of the Leeds University.

The proceedings commenced with a discussion on the constitution and methods of the section. It was pointed out that no attempt is being made systematically to record the flowering plants and ferns of the county. The East Riding is in the most fortunate position, the flora of this area being the most recent publication of this nature in the county, and the author, Mr. J. Fraser Robinson, still keeping a sharp look-out for new records; most botanists are aware of this, and send them along to him.

When we turn to the West and North Ridings we are not so happily placed. In the West, for many years following the publication of 'The West Riding Flora,' by the late F. Arnold Lees, things were exactly in keeping with the East to-day. Lees kept the records, and all new finds were reported to him; moreover, he wrote a supplement to this flora incorporating the new matter, but this, unfortunately, has not been yet published. In some measure this is due to the enhanced cost of printing. Since his death no arrangements have been made to continue his work, partly due to the fact that the manuscript was not available to a possible successor. Of course, in most cases, interesting finds are published in *The Naturalist*, but this is not always the case. In the North Riding we have the same case of the author of the 'Flora,' J. G. Baker, continuing for many years to be interested in this work, but since his death the work is at an end. Alternative suggestions of a Phanerogamic Committee, or new officials of the section, were discussed, and finally it was decided to appoint Recorders for each Riding.

Mr. J. Fraser Robinson undertook to deal with the East, and Mr. J. Beanland promised to assist Mr. W. A. Sledge with the West. Names were suggested for the North, but as the individuals were not present, this was left over to a later date.

The officials of the section and of the committees were suggested for election at the Annual Meeting of the Union, and also some localities were proposed for the consideration of the Executive for next year's excursions. After a welcome cup of tea, the evening meeting listened to three papers, the first by Mr. A. Malin Smith, who spoke on the 'Micro-flora of a Bog.' The bog, which had been regularly visited, and the species carefully noted, was small in area, with algæ present in water holes in bog-moss and mud, and also growing on mud and in a stream. Lists of species were shown on the blackboard, and questions of water temperature and acidity were discussed. The temperature of the algæ in the water was found to be about 3° C. higher than that of the surrounding water. Another observation showed that some species of algæ tend to conjugate, whereas other species of the same genus never do so, apparently this tendency to conjugate is inherent in the species and not due to varying conditions.

Mr. Sledge dealt with his work on 'The Causes of Variation in Leaf Shape in *Taraxacum*.' He pointed out that in a normal way the leaf shape varies at definite portions of the plant's life. The seedling has entire leaves for some months, then they gradually assume the dissected shape, which gets most marked just before the plant flowers, say in the second or third year; directly after this, entire leaves are again produced, and once more they get more and more dissected, until the second flowering, after which the same sequence occurs. Experiments were tried, the general result being that a high ratio of Carbohydrate to Nitrogen in the leaf gave the dissected leaf (and also the tendency to flower), while the lowered ratio (as after flowering) giving the entire type of leaf.

Dr. Woodhead spoke on the 'Pollen Statistic Work of Dr. Erdtman,' who recently visited the Huddersfield district and investigated the peat there. Dr. Woodhead detailed the methods adopted for taking the samples and working at the material afterwards, and showed the type of diagram prepared to demonstrate the results of the examination. He also showed charcoal found in fire holes in the sandy soil below the peat near Huddersfield, with associated flints, and he described the sequence of archaeological discoveries which have helped to open up the difficult question of the age of these peats.

CHRIS. A. CHEETHAM,

————— : o : —————

A beautifully coloured plate of Nyasa Love-birds is given with *The Avicultural Magazine* for July.

The Autumn number of *The Amateur Aquarist* has papers on 'The Whirligig Beetles,' by Ray Palmer; 'Common Carp,' by J. D. Paterson; 'Freshwater Bristle-worms,' by E. B. Choat; and 'Plants for the Aquarium,' by L. B. Kattersns.

*The Vasculum* for October contains papers on 'Experiments on the Egg-laying instincts of *Rhodites Rosæ*,' by Dr. J. W. H. Harrison; 'Acanthocyanins: their formation and occurrence in Plant Cells,' by M. Thomas; 'British Spiders,' by J. E. Hull; 'Ivy-leaved Bellflower in Co. Durham,' and 'Minerals of the North Country,' by J. E. Smythe.

R. A. Fisher and E. B. Ford, in *Nature*, No. 2971, write on 'The Variability of Species,' and give the results of the examination of thirty-five species of lepidoptera (chiefly common British moths) and 'the study of the variation to be expected theoretically in a population exhibiting inheritance wholly on Mendelian lines, with the corresponding appropriate mutation frequencies, under the influence of natural selection.'

## NEWS FROM THE MAGAZINES.

A. F. Brunner writes on 'The British Daphniæ,' and E. B. Choat on 'Freshwater Planarian Worms,' in the Summer Number of *The Amateur Aquarist*.

Dr. T. G. Longstaff has an article on 'Local Changes in Distribution,' containing many interesting references to British birds, in *The Ibis* for October.

*The Librarian* for September contains an article on 'The Curator.' We trust *The Museums Journal* will retaliate and give us its views upon 'The Librarian'!

L. Soos and H. Schlesch favour us with a reprint of their article on Ueber zwei arktische Mollusken aus Grönland, which appeared in the *Archiv für Molluskenkunde*.

'Drainage of Plex Moss, Barton Moss and Southern Heyes, near Ormskirk,' by R. W. Eaton, appears in *The Journal of the Ministry of Agriculture* for October.

*The Irish Naturalists' Journal* for July contains a scholarly paper on the 'Irish Elk,' by Dr. R. F. Scharff, and 'Prehistoric Mammals in Ireland,' by H. E. Forrest.

An excellent portrait and memoir of the late Sir William Ridgeway, the latter written by Professor J. L. Myres and Professor A. C. Haddon, appears in *Man* for October.

An illustrated account of the 'Story of the Sea-Swallows,' as seen on the East Coast of England, occurs from the pen of C. W. Greatorex in *Animal World* for October.

*The Entomologist* for July includes a paper by J. W. Heslop Harrison on 'Zooecidia from a Peat Bed near Birtley, Co. Durham, with some reference to other insect remains.'

Dr. R. T. Gunther considers that Shakespeare was not far wrong when he wrote that what Time hath scanted man in hair he hath given him in wit (*Journ. Brit. Assoc.*, Oxford, p. 57).

An illustration of the new British Museum exhibit, showing the way in which Divers, Guillemots and Razorbills die as a result of their plumage being smeared with oil, appears in the autumn number of *Bird Notes and News*.

The editor of *The Medical Herbalist* says 'We are informed that by far the greater number of children born to-day are unvaccinated. We are, therefore, asked to believe that the major portion of English parents are "fools."'

Mr. A. L. Armstrong, in *Man* for September, gives analyses of bronze implements and foundry metal, prepared by Professor C. H. Desch. The specimens supplied for the purpose are in the Museums at Hull, York and Halifax.

The advertisement pages of *The Medical Herbalist* advocate Parker's Herbs, Roots and Barks, Heart Tonic Drops, Heath and Heather's Herbs, Diseases of the skin cured permanently and completely, Cherry's Slumber Tea, Ebonies (4½d. a tin), Postal Tuition, Inhale health, Malted Slippery Elm Food and Dandelion Coffee.

A photograph of 'The History Gallery at the Hazlemere Educational Museum' in *The Museums Journal* for October shows about twenty specimens and hundreds of framed pictures and diagrams. There is a cuckoo exhibit, but 'no economic ornithology exhibit has yet been attempted, but guidance is offered by yellow, green and red labels.'

In view of the fact that in *Discovery* for October, Mr. J. R. Moir, without any hesitation, seems to consider that the Suffolk Crag was formed 1,000,000 years ago, it is rather encouraging to find that no less an authority than Professor Elliot Smith, in writing to *The Times* recently, protests against the suggestion that Magdalenian Art dates back to 30,000 years, and M. S. Reinach, after giving very good reasons, is of the opinion that the Magdalenian date should only be 5000 to 6000 years.

## NORTHERN NEWS.

The purity of milk can be tested in the Sunderland Museum.

The death is announced of Prof. F. W. Gamble, F.R.S., Professor of Zoology at the Birmingham University.

Part LIX. of Buckman's *Type Ammonites* contains illustrations of Yorkshire examples of *Ammonites attenuatus*, *A. delicatus* and *A. intertextus*.

The Report of the Director of the Warrington Museum for the two years ending June 30th, 1926, contains a good list of valuable additions to the museum collections.

*The Daily Chronicle* for September 29th has an interesting illustration of an old woodcut from a German work, published in 1700, ridiculing 'Dowsing,' or divining for water.

We have been favoured by Charles Janet with copies of his works entitled 'Constitution Orthobiontique des êtres vivantes,' and 'Le Volvox. Ontogénèse de la blastéa volvocéenne.'

Part X. of *Index Animalium*, by C. Davies Sherborn (pages 2249-2568, 10/-), has been issued by the Trustees of the British Museum, and contains a record of the names *Eurystomus-funereus* issued between 1801-1850.

Cold soup, devilled chicken, marrow bones, cheese straws, ham croutes with coffee, was considered fit fare for the Red Lions at Oxford, who were told to growl and guzzle. Some of them certainly growled: we saw nor heard any 'guzzling.'

The British Museum has issued a third edition of its excellent *Guide to the Antiquities of the Stone Age*, in which, however, we notice that the so-called Maglemose harpoon-heads of bone found in Holderness are apparently accepted as genuine.

The Whitby Literary and Philosophical Society is to join the Pannett Trustees in connexion with the erection of an Art Gallery and Museum in Pannett Park. The collections in the old museum at the Pier will be removed to the new building.

The British Science Guild has issued a substantial 1925 supplement to its Catalogue of British Scientific and Technical Books (166 pp., 2/6). The list has been arranged by Daphne Shaw, and the various volumes included are placed under suitable headings.

The British Museum (Natural History) has issued a fourth edition of its 'Guide to the Exhibited Series of Insects in the Department of Entomology.' With 66 pages and 62 excellent illustrations, the museum is still able to sell the catalogue at the low price of one shilling.

The Ministry of Agriculture and Fisheries has issued *Sea Fisheries Statistical Tables, 1925* (50 pp., 3/6 net, H.M.S.O.), which give particulars of quantities and value of landing, method and place of capture of various species of food fish, the figures being rather startling.

We learn from the press that some flint implements have been found at a Roman outpost, near Osgodby, which 'may be either Palæolithic or Neolithic,' an opinion which seems very helpful. According to the same writer the site 'may have been that of a tribal hunting camp in the still more distant past.'

Mr. George F. Lawrence, the well-known London Antiquary and Inspector of Excavations to the London Museum, has retired under the age-limit. It is not too much to say that the extraordinary wealth of the collections in that museum are largely due to Mr. Lawrence, and that his retirement is a disaster both to the museum and to Londoners.

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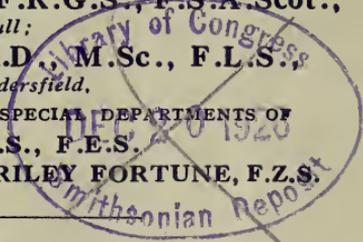
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## NOTES AND COMMENTS.

## ANCIENT DOVECOTES.

No. 3 of the *Brighton and Hove Archæologist*, published by the Brighton and Hove Archæological Club, would quite easily be a credit to one of the leading archæological societies in the country. It is well printed and admirably illustrated, and the Editor, Mr. F. Harrison, has made an excellent selection of papers, which deal with a Roman Villa; Ancient Roads; Valley Entrenchments; A circus or meeting place of a British or Romano-British Community; Ancient Pottery; Family History; Etymology of the word 'Groyne' (considered to be derived from the French 'Groin,' signifying the snout of a pig); Ancient Deeds; Brighton Church and

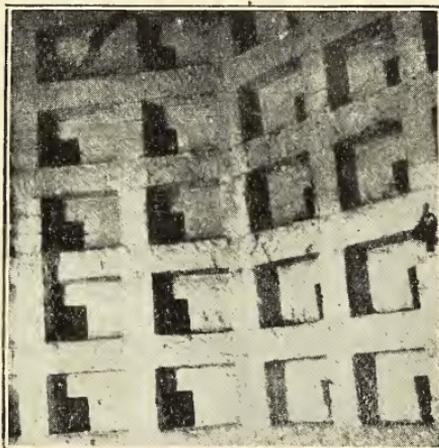


Coombe Place Dovecote.

Chapel; and perhaps the most generally interesting of all is the paper on 'English Dovecotes,' by William Law, with photographs of the interior and exterior of a large number of Sussex examples. These structures seem to be more common in the south than in the north.

## COAL.

The National Museum of Wales is to be congratulated on the production of a volume entitled 'Coal, and the Coalfields in Wales,' by Dr. F. J. North, (viii. + 175 pp.), which is a magnificent summary of our knowledge of coal in general, and of the Welsh Coalfields in particular. By the aid of



Coombe Place Dovecote Nesting Holes.

coloured and other plates, diagrams, sections and maps, Dr. North has produced a very readable and valuable narrative. Our only hesitation in thoroughly recommending it to all our readers is that at the modest price of one shilling there must surely be a loss on every copy sold. The pamphlet reached us during the first week in November, and as it contains reference to an article appearing in *The Naturalist* for October of this year, we must congratulate the Museum and the author on being thoroughly up to date!

#### THORBURN'S BRITISH BIRDS.

The final volume (IV.) of Thorburn's 'British Birds' has been issued by Messrs. Longmans, Green & Co. (x. + 154 pp. 16/- net.) and deals with the series including Woodcock, Snipe, Sandpiper, Stint, and similar species; Terns, Gulls, Skuas, Razorbill, Puffins, Divers, and Petrels. Northern naturalists will be particularly interested in this volume on account of the great number of local breeding species represented. Perhaps one of the most successful of the illustrations is that of the Puffin, which Mr. Thorburn seems to have caught in a typical attitude. The Ruff and Reeves and the Snipe are also exceptionally well done.

#### PURSUING THE WHALE.\*

The author tells us where and when he was born, particulars about his ancestors, and gives a photograph as frontispiece, though we are informed it represents him as he was at the age of 37. Of more interest to anyone else, however, are the accounts he gives of whaling, both arctic and antarctic species being dealt with, many photographic and other illustrations of whales, eskimos, etc., being given. Many parts of the work are extremely interesting, and will appeal to those fond of travel, as well as to students of our largest mammals.

#### POPULAR SCIENCE.†

Many of our readers have doubtless had the pleasure of listening to Professor Julian Huxley, who is following in the footsteps of his illustrious ancestor. The present volume contains collected essays of particular scientific and economic importance, among his eighteen chapters being, Heredity; The Determination of Sex; The Control of the Life-Cycle; Birth Control; Thomas Henry Huxley and Religion; Birds and the Territorial System; The Frog and Biology; and the Tadpole: A Study in Developmental Physiology.

\* By John A. Cook. London: John Murray, x. + 344 pp., 18/-.

† 'Essays in Popular Science,' by Julian Huxley. London: Chatto & Windus, xii. + 307 pp., 16/- net.

ENTOLOMA REPANDUM (BULL.) FR. IN  
YORKSHIRE.

A. E. PECK.

THIS pink-spored agaric was found during the Yorkshire Naturalists' Union Fungus Foray at Mulgrave Woods, September, 1926.

It is faithfully illustrated by M. C. Cooke in his 'Illustrations of British Fungi,' Plate 313, but this plate was criticised by the eminent French mycologist, Emile Boudier, in the words 'Est à mon avis un *Inocybe*.' To this criticism Dr. Cooke replied 'The lower figures were communicated by Rev. M. J. Berkeley as *Agaricus repandum* Bull., but with what notification cannot now be ascertained.'

In August, 1914, I found specimens, which I identified as this species, in short grass on the Race-course, Scarborough, and sent them to Alfred Clarke, of Huddersfield, for confirmation.

On August 17th, 1914, Clarke wrote me 'Thanks for *Entoloma repandum*, which is quite all right in every respect. I was in Halifax to-day and showed it to Charles Crossland: he and I are very pleased you have turned it up, as it has only one other record for Yorkshire which was regarded as doubtful. Your specimens with decidedly *pink* spores settle that matter. Congratulations!'

Crossland sold to me his volumes of 'Cooke's Illustrations,' wherein at the appropriate place he had inserted a slip reading as follows:—'*Entoloma repandum* (Bull.) Fr., Had specimen from the Racecourse, Scarborough, August 14th, 1914, agreeing exactly with this figure. Spores pink, globose, but slightly angular, 8  $\mu$  diameter. No cystidia. Fits in all details with Bulliards and Berkeley's description.' My own note reads:—'The odour of 'new meal' mentioned by Worthington G. Smith is quite pronounced, and the spores are globose and warted as described by Masee. There are no cystidia present. Pileus 'cracks,' a strong reminder of *Inocybe*. Specimens fairly plentiful, Racecourse, side nearest Ayton Road.'

In Carleton Rea's 'British Basidiomycetæ' he describes the species as 'rare,' and as his note 'v.v.' is lacking, it would appear that this species is one of the comparatively few which this long-experienced and distinguished author had not seen up to the time of publication.

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**Hen Harrier and Spotted Crake in Yorkshire.**—On November 4th I saw a fine male Hen Harrier at Little Beck, near Sleights, and a Spotted Crake was shot on October 21st near Northallerton and sent to me.—W. S. MEDLICOTT.

**Is *Paludella squarrosa* Brid. a Cumberland Moss?**—In the new 'Census Catalogue of British Mosses,' this almost extinct British species is given for V.C. 70 (Cumberland) without any question. The only record I am aware of, is a note in the Moss Exchange Club Report for 1913, which records a single stem in the Herbarium of the late Rev. Augustin Ley (now at the Birmingham University.), found on Scawfell Pike in August, 1871. This is a most unlikely place for it. Mr. Binstead, who was a personal friend and neighbour to Ley in Herefordshire, writes: 'Ley told me he might have been mistaken, and thinks a stem or two from Norway might have got into his packet—he had been to Norway shortly before.' Unless there is other evidence of its occurrence in this county, it would be best to bracket it with other doubtfuls.—JAS. MURRAY, Greta.

**Marine Zoology Notes from Scarborough.**—I have lately procured the following rather uncommon natural history specimens: Long-armed *Munida* (*M. rugosa*), male (the first local specimen), caught in the trawl off the Castle Hill, Scarborough, 30/9/26; Pennant's Nut Crab (*Ebalia pennantii*), also caught in the trawl off Scarborough, though further out, 7/9/26; Cleanser Swimming Crab (*Portunus depurator*), from Whitby fishing grounds, 2/10/26, male; Knotted Cushion Starfish (*Goniaster equestris*), from deep water off Flamborough—a very large specimen, 10/9/26; another four-horned Sea Scorpion (*Cottus quadricornis*), in much better condition than the other I procured, 27/9/26; the little fish, the Pogge (*Agonus cataphractus*) is very commonly brought up in the sole-net about 2 miles out to sea here; the Shell *Panopæa norvegica*, from off Flamborough, 13/9/26.—J. A. STEVENSON.

**Oleander Hawk Moth at Hull.**—A fine specimen of this moth, in excellent condition, was caught alive on an allotment in Hull on September 9th, 1926, and was brought to the Museum by a boy.—T. SHEPPARD, Hull.

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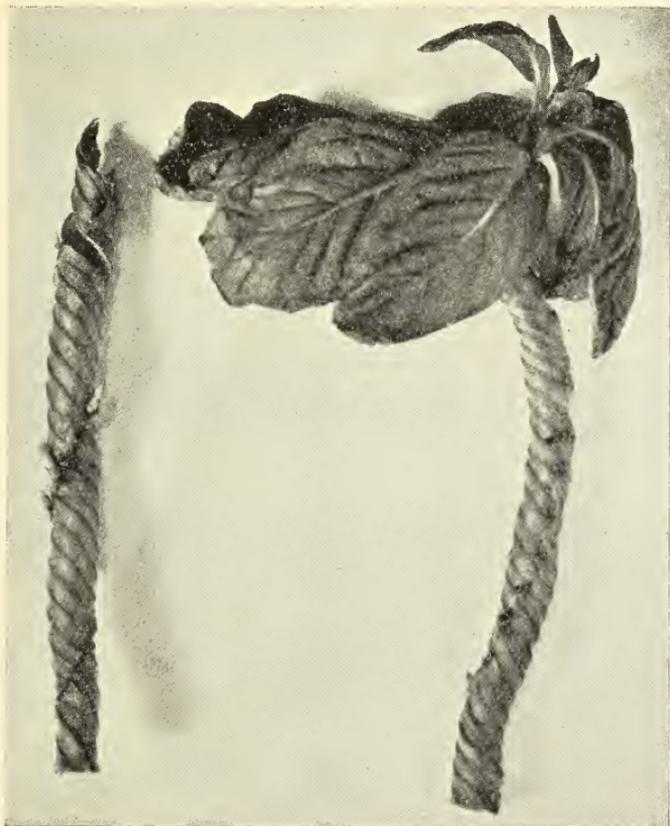
**Animals Looking into the Future**, by W. A. Kepner. London: Macmillan & Co., x.+197 pp., 7/6. The Professor of Biology in the University of Virginia dedicates this book 'To the most potent factors in my personal development: My wife, Lida Hooper Kepner, and my children, Beth, Hooper, and Lida.' He tells us that 'the statement that animals look into the future will seem obvious to the reader, and yet this is one of the evident things, in nature, concerning which the biologists of the nineteenth century took little notice. This book is written to emphasize this conspicuous feature of animal conduct, because preparing for the future is a highly significant characteristic of vital activity which is all too often overlooked at present.' This follows with chapters dealing with Man Looking into the Future; Social Insects; Simple Multicellular Animals; Solitary Insects; Unicellular Animals, all looking into the Future; and the Material of Animals' Bodies.

## SPIRAL TORSION IN MENTHA.

PROF. J. H. PRIESTLEY.

THE accompanying photograph, by the University photographer, Mr. J. Manby, shows a specimen of spiral torsion in the garden mint sent to me by Mr. T. B. Holmes, Castle View Terrace, Skipton, in June this year.

Curiously enough, although the phenomenon is by no means



common, and no specimens had ever reached me prior to this year, another specimen of spiral torsion, also in mint, reached me earlier in the year from Miss Musgrave, Bradford, which had been brought to school from a garden in the Bradford area.

The specimen, an equally fine one, was forwarded to Dr. Daydon Jackson, Secretary of the Linnean Society, London.

The mint is normally a plant with opposite decussate leaves, but it will be seen, on the specimen on the right of the photographs, where the scars of the lower, fallen leaves are visible, that the leaves lie above one another in a single row ;

in the specimen on the left, this line of leaf scars, or of axillary buds, describe a fairly sharp spiral around the stem, the spiral running in a reverse direction to the sharper spiral made by the rib, which is obviously related to the angle of the normal square stem. These spiral torsions are discussed by de Vries in his book, 'The Mutation Theory' (Vol. II., Part 2, chap. 4), and in a paper in the *Jahrb. für wiss. Bot.*, Vol. 23, p. 149, 1892, entitled 'Monographie der Zwangsdrehungen,' there is reference to an earlier case of this phenomenon in *Mentha viridis*, reported by van Hall from the Botanical Garden of Gröningen in 1839.

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**Reptiles and Amphibians: Their Habits and Adaptations**, by **Thomas Barbour**. London: G. Harrap & Co., Ltd., xx. + 125 pp., 10/6. The Curator of the Reptiles and Amphibians in the Museum of Comparative Zoology at Harvard College has produced a well-illustrated volume dealing with many uncommon forms of life, rarely seen by British naturalists, excepting in Zoological Gardens, and some of them not even there. The illustrations show how rare reptiles in the tropics are specially adapted for their particular mode of living, and some of the photographs indicate the remarkable way in which some reptiles are protectively coloured. Special attention is given to such features as the fingers and feet of some of these reptiles, and the author deals with the origin, past and present distribution of different members of the family. He has been admirably assisted in his task by the excellent photographs prepared by Mr. G. Nelson.

**A Naturalist at the Zoo**, by **E. G. Boulenger**. London: Duckworth, 206 pp., 10/6. With the aid of an enormous number of well-executed sketches by L. G. Brightwell, the author takes us round the Zoo and describes the more interesting species, and represents them in several somewhat unusual attitudes. Mr. Boulenger, who is the Director of the Zoological Society's 'Zoo,' is peculiarly fitted for this task, and describes the monkeys, lemurs, bears, lions, hippo's, tapirs, seals and elephants.

**Winter Blossoms from the Outdoor Garden**, by **A. W. Darnell**. London: Reeve & Co., xxiv. + 335 pp., 21/- net. In the hope of inducing owners of gardens to encourage the growth of winter flowering plants this book has been written. The author first gives practical hints as to the method of rearing different species under the best of conditions, and then deals seriatim with the various suitable forms of plants. There are about two dozen excellent plates, besides illustrations in the text, the coloured ones especially being remarkably well done. Those of the Rhododendron, Crocus, Acacia and Iris are exceptionally fine.

**The Forests of India**, by **E. P. Stebbing**. London: John Lane, The Bodley Head, Vol. III., xviii. + 705 pp., 42/- net. Professor Stebbing has completed his wonderful work on the Indian Forests. He now refers to the Progress of Conservancy and the Development of Research in Forestry during the past quarter of a century, and gives reviews of the progress of Conservancy in the different provinces between 1871 and 1900. It is impossible adequately to realise the enormous amount of work which has been accomplished in the Indian Empire, work which is described in the 700 closely printed pages in this volume. In his twenty-two chapters we get an idea of the great amount of research work which is there carried on. Additional interest is added by scores of excellent illustrations from photographs.

## METHODS OF STAINING PLANT SECTIONS FOR MICROSCOPICAL EXAMINATION.

G. A. C. HERKLOTS.

THE art of staining a plant section, say, for example, a sunflower stem, is to enable the observer to distinguish, not only the arrangements of the tissues Xylem, Phloem, Cortex etc., but the features of the individual cells in the respective tissues. It has been found that various tissues stain with different intensities with different stains, and this fact is exploited in the following methods. In the red and green combination all dead tissues, *e.g.*, the wood, stain bright red, and living tissues, *e.g.*, the pith and cortex, stain green. Similarly, with the alternative method, the dead and living tissues stain purple and brown respectively. The material should first be killed and fixed, *i.e.*, the protoplasm precipitated in a form as similar to the living structure as possible, by 90% alcohol, 2% chromic acid in water, or other fixative, before sections are cut, otherwise distortion and unequal staining will occur.

Stain sections of woody tissues in Safranin or Cotton Red for at least 20 minutes, sections of tissues with very little xylem will benefit from a much longer treatment. Only a few drops of stain need be employed, a water glass being a suitable receptacle for sections and stain, Wash the sections with 70% alcohol, to remove excess stain and take up to absolute alcohol. This means wash the sections in the watch glass by means of a hand pipette (fountain-pen filler), with 70%, 90% and absolute alcohol 2 or 3 times, in succession to remove all traces of water. Place two or three drops of the green and orange mixture (stain No. 5.) on the sections for a few seconds or a minute, the time depending on the nature of the sections, and wash with absolute alcohol, (to a 100 ccs of which a cc of clove oil has been added.) The red stain diffuses out of the parenchymatous tissues, which are now stained a grass-green colour. This process is called differentiation, and skill in this, which comes with practice, makes the whole difference between a badly stained section, and one in which the tissues are stained with the correct, and only the correct dye. Wash with absolute alcohol, and once or twice with pure xylol, and finally mount the sections, one or two to a slide, in Canada balsam, cover with a cover glass and leave to dry. Sections of Lycopodium stem, water plant tissues, and both roots and stems of Angiosperm and Gymnosperm plants stain particularly well with the above method.

Stain sections in Gentian Violet for from 12 to 24 hours, wash out excess stain with water, or dilute acid (1.0% Acetic or Hydrochloric) followed by water to remove traces of acid, and

stain for a short time in dilute Bismarck Brown solution. Take up to absolute alcohol, and differentiate as in the previous method. Sections of woody tissues, *e.g.*, oak twig, stain remarkably beautifully by this method. Fern material and Equisetums respond to this combination of stains.

#### STAINS.

1. *Safranin* mixture of equal parts of a 1% solution in 90% alcohol, and a 1% solution in water or aniline water. (Aniline water, shake up a little aniline oil in water and filter).
2. *Cotton Red* 1.5% in 70% alcohol.
3. *Light Green* 1.0% in a mixture of equal parts clove oil and absolute alcohol.
4. *Orange G.* similar to above.
5. Equal parts, 3 and 4.
6. *Gentian Violet* similar to Safranin.
7. *Bismarck Brown* 2% solution in 70% alcohol or water as required.

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**Sanctuary! Sanctuary!** by **D. L. Sharp**. London: Harper Brothers, 227 pp., 7/6 net. From this we get an idea of the work being accomplished in America towards the preservation of birds. The book begins with an account of a small group of islands on the Pacific Coast which was set aside as a Wild Bird Sanctuary in 1907 by President Roosevelt. The author gives an account of first-hand experiences with bird life, and those interested in American species will find the volume very entertaining.

**Evolution and Religion in Education**, by **H. Fairfield Osborn**. London: Charles Scribner's Sons, xiii.+240 pp., 7/6 net. Professor Osborn, one of the most popular writers on natural history subjects in the United States, has now published a series of addresses, some of which were published in the controversial columns of American newspapers, and the addresses were given to students, teachers, conventions, and the National Republican Club. His eleven chapters deal respectively with Crossing Swords with the Fundamentalists; Evolution and Religion; Evolution and Daily Living; The Credo of a Naturalist; The Earth Speaks to Bryan; The Tennessee Trial; The Case for Human Evolution in 1925; How to Teach Evolution in the Schools; How to Restore Religion to the Schools; Convincing Evidence of the Geologic Antiquity of Man; and A New Basis of Creative Evolution. Readers on this side of the Atlantic will be glad to get these somewhat scattered addresses in a compact form.

**Records of Birds Bred in Captivity**, by **E. Hopkinson**. London: H. F. & G. Witherby, x.+330 pp., 15/-. In view of the increased interest taken in aviaries, and the importance attached to the subject by the publication of *The Avicultural Magazine* and other journals, it seems necessary that there should be, in some form, a record of the various species which have been bred in captivity. This laborious compilation has been carried out by Mr. Hopkinson, and records of over eight hundred species are given, with details of the places in which they were first reared, and so on. The book is divided into three parts, namely, Species which have been bred in Confinement; Hybrids; and Summary. There is no question that aviculturalists are deeply indebted to Mr. Hopkinson for his work.

## MYCOLOGISTS AT MULGRAVE WOODS.

A. E. PECK.

*Hon. Sec. Mycological Committee.*

THE Annual Fungus Foray, constituting the 331st meeting of the Yorkshire Naturalists' Union, was held at Mulgrave Woods, September 18th-23rd, 1926. Headquarters were at 'The Bungalow,' Sandsend. The use of the old schoolroom as a work and exhibition room had been granted, as upon former occasions, by the Vicar of Lythe. The following Members of the Committee were present:—Dr. Harold Wager, F.R.S. (Chairman); J. W. Haigh Johnson, M.Sc; R. Fowler Jones; E. Snelgrove, B.A; J. Hartshorn; Greevy Fysher; Mrs. M. Fysher and A. E. Peck (Hon. Sec.). Others present included W. Bellerby; A. Wentworth Ping, M.A; and Mr. Featherstone; Miss Miall; S. D. Fysher; Miss Laura Ingham and other Members of the Whitby Naturalists' Society.

The first outing was on Saturday afternoon, when the Whitby Naturalists turned up in strength; the route taken was by the wild duck pond, returning by the Rigg. Fungi were not numerous, the woodlands and paths being very dry and agreeably clean. Fine weather continued throughout the visit.

The first noteworthy discovery was *Pluteus patricius* Schulz, which the writer found growing in numerous large clusters on a great heap of heated old sawdust at East Row. Clusters ranged up to 18 inches in diameter, and individual specimens reached 7 inches across the cap. Cooke's Illustrations of the species might have been made from some of the smaller ones found, but reference to the works of Massee and Cooke give an impression that those authors never had experience of specimens of the large size now under notice. Under the microscope, the well-known flask-shaped *cystidia*, which are characteristic of the genus *Pluteus*, were examined.

Miss Denton, of Sandsend, cleverly portrayed a number of specimens in colour, the sheet now being in possession of the writer.

To the credit of Mr. Johnson stands the discovery of two fine examples of the earth-star *Geaster rufescens*, a new record for Yorkshire N.E. These measured 3 inches in diameter. The flesh of the 5-lobed endoperidium was  $\frac{1}{8}$  inch thick, and distinctly white where it had split, otherwise, the whole plant was coloured as the specific name implies. Miss Denton also skilfully painted one of these.

The subjoined list includes all the species met with of more than ordinary interest only. It has been annotated by our County Recorder, Mr. F. A. Mason. In all, 150 species were recorded.

At an evening meeting, Dr. Wager gave an address to an interested audience, which included a number of visitors, entitled, 'Recent Progress in Mycology,' Mr. Haigh Johnson gave an account of 'River Pollution in the West Riding,' and Mr. Peck spoke of the fungi which he had observed in inland Natal, during his recent trip round Africa. At 5000 and 6000 feet above sea level, he there found the species to be what he was quite familiar with at home. The genera *Amanita*, *Collybia*, *Russula*, *Laccaria*, *Psalliota*, *Stropharia*, *Phallus*, *Scleroderma*, *Stereum*, all being typical of what one would find in Yorkshire.

## RECORDS.

*Lepiota felina.**Tricholoma terreum* var. *orirubens.**T. terreum* var. *atrosquamosum.*† *T. cinerascens* (Bull.) Quel. (= *Clitocybe fumosa*).*Pleurotus dryinus.*† *Lactarius umbrinus.*\* *Russula delicata.**Panus conchatus* (on sawdust heap).

\**Pluteus patricius* Schulz.

†*Entoloma repandum*.

*Leptonia euchroa*.

*Psaliota angusta*.

\**Stropharia punctulata*.

†*Polyporus nummularius*.

*Daedalea confragosa*.

\**Phylacteria clavularis* (= *Thelephora clavularis* Fr.).

\**Typhula Grevillei* Fr.

†*Geaster rufescens*.

† New to Yorkshire N.E. Division.

\* New to Yorkshire.

*Addendum*.—Two of the species annotated above as new to the N.E. Division, have been collected in the Division before, although there appears to be no printed records of their discovery. Mr. Peck informs me that *Tricholoma cinerascens* occurred at Mulgrave many years ago, and that under its synonym, *Clitocybe fumosa*, a specimen found on Oliver's Mount, Scarborough, October 8th, 1920, was exhibited at the Scarborough Field Naturalist's Society. The other species, *Entoloma repandum*, was found by Mr. Peck on Scarborough Racecourse, August, 1914.—F. A. MASON.

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## YORKSHIRE NATURALISTS' UNION : ENTOMOLOGICAL SECTION.

W. D. HINCKS AND T. B. KITCHEN.

THE Annual Meeting of this Section was held on October 30th in the Library of the Leeds Museum. In the absence of Mr. G. T. Porritt, Mr. C. A. Cheetham occupied the chair.

The exhibits were as follows :—

COLEOPTERA.—Mr. M. L. Thompson :—*Atheta oblonga* Er., Middlesborough ; *Bolitochara mulsanti* Shp., Kildale ; *Phyllodrepa puberula* Bernh., Saltburn ; *Cantharis fulvicollis* Fab., Stokesley ; *Malthinus frontalis* Marsh., Kildale ; *Longitarsus membranaceus* Foud., Redmire ; *Polydrusus confluens* Steph., Allerthorpe Common ; *Orchesia minor* Walk., Redmire ; *Mycetophagus atomarius* F., Castle Howard ; *Aleochara mæsta* Gr., Arnciffe Woods.

Mr. T. B. Kitchen :—*Stenostola ferrea* Schr., Thorner.

Mr. J. R. Dibb :—A box of local Yorkshire beetles, and a specimen of *Spermophagus sericeus* Geoffr., a genus and species new to Britain, taken at Blackmoor, near Leeds.

Mr. A. Thornes :—*Lamproyris noctiluca* L., East Keswick ; *Anobium domesticum* Fourc., and infested timber.

Mr. E. G. Bayford :—*Cerapheles terminatus* Mén., Yorkshire ; *Galeruca bilineata*? imported from North America.

Mr. Maxwell Stuart :—*Saperda populnea* L., Askham Bog ; *Dorcus parallelipedus* L., Everingham ; *Cionus blattariæ* F., Ampleforth.

HYMENOPTERA.—Mr. A. Thornes :—A large species of foreign ant discovered in hardwood during sawing operations, with a section of the wood from which the ants had been removed.

Mr. E. G. Bayford :—*Myrmosa melanocephala*, ♀ ; *Psen dahlbohmi* ; *Apanteles fulvipes*.

Mr. R. Butterfield :—*Crabro tibialis*, *C. dimidiatus* and dipterous prey, *C. chrysostomus*, *Myrmosa melanocephala*, winged ♀♀.

Mr. A. Beanland :—*Pteromalus puparum*, the Braconid parasite of *Vanessa io* ; *Sirex gigas* L.

HEMIPTERA.—Mr. M. L. Thompson :—*Nabis ericetorum* Sch., Hawley; *Teratocoris saundersi* D. and S., Grinton; *Calocoris ochromelas* Gmel., Kildale; *C. roseomaculatus* De G., Eston; *Cyllocoris flavonotatus* Boh., Castle Howard; *Mecomma ambulans* Fall., Sleights; *Idiocerus confusus*, Grinton; *Limotetrix striola* Fall., Eston.

Mr. E. G. Bayford :—*Triochodectes subrostratus*.

DIPTERA.—Mr. C. A. Cheetham :—*Liogaster splendida* Mg., Castle Howard, 3/7/26; *Hedoneura (Elgiva) eucularia* L., Castle Howard, 3/7/26; *Hercostomus (Gymnopternus) metallicus* Stan., Castle Howard, 3/7/26; *Sapromyza illota*, Middleham, 1/8/26; *Chilotrichia imbuta* Mg., Austwick, 26/6/26; *Thaumastopectera calceata* Mik., Crag Wood, 25/6/26; *Empis aestiva* Lw., Gormire, 4/7/26; *Platypareia discoidea* F., Colt Park, 26/6/26; *Agathomyia antennata* Ztt.; *Hypophyllus obscurella* Flin.; *Argyra leucocephala* Mg., seen feeding on whitish worm-like larvæ about their own length; they pulled them from the ground as a thrush does a worm, Crag Wood, 4/8/26.

Mr. J. R. Dibb :—Twenty-one of the forty-five British species of the group Tanypinæ (fam. Chironomidæ) captured in the Leeds district by Mr. Dibb, and at Ilkley by the late G. Grace.

Mr. W. D. Hincks :—Long series of some twenty-five Yorkshire species of the group Chironomus taken in the Keighley district by Messrs. Butterfield and Wood.

ORTHOPTERA.—Mr. C. A. Cheetham :—An exotic species taken by Mr. Sanderson in the Malay Peninsula, one remarkable for its huge size.

Mr. T. B. Kitchen :—*Panchlora exoleta* Klog., an exotic cockroach caught on the wing in Leeds, probably introduced in bananas.

LEPIDOPTERA.—Mr. B. Morley :—A nice bred series of melanic *Hadena dentina* from Skelmanthorpe, 1926, and for comparison a series of the same species from Skelmanthorpe taken twenty years ago. The latter were much lighter in colour. Also, on behalf of Mr. G. T. Porritt, a short series of *Hadena pisi* from the Royd Edge Moors, Huddersfield, of an almost uniformly dark purplish-brown colour, with the exception of the usual yellow subterminal stripe: they were much darker than the type, or var. *scotica*, and were apparently now the prevailing, if not the only form, on these moors. Also a series of melanic *Crambus hortuellus* from the Waterloo Tip, Huddersfield.

Mr. Ashton Lofthouse :—Remains of *Acherontia atropos* extracted from a bee-hive.

Mr. Maxwell Stuart :—Lepidoptera from Everingham district, including a remarkable variety of *Noctua xanthographa*.

At the evening meeting reports of the year's work were read, showing that a considerable amount of good work had been done in spite of a rather poor season.

Very few changes were made to the list of officers.

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## Y.N.U. : VERTEBRATE ZOOLOGY SECTION.

E. WILFRED TAYLOR.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists' Union was held in the library of the Leeds Philosophical Society on Saturday, October 23rd, Mr. F. H. Edmondson occupying the chair.

The sectional meeting was preceded by meetings of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee, and of the Yorkshire Wild Birds and Eggs Protection Acts Committee.

Mr. R. Fortune exhibited an example of Cowe's Redpoll and the Willow Tit obtained at Scarborough by Mr. W. J. Clarke; Mr. C. Mosley a photograph of a female Marten obtained at Broomhead, near Sheffield,

on July 30th last; Mr. H. B. Booth the skin of the American Cedar Waxwing, and Mr. E. W. Wade some Sharks' teeth, and a Pheasant's leg, the bones of which had been broken, reunited, and given rise to the growth of a new spur.

Mr. F. H. Edmondson gave 'A Report on the Sixth International Ornithologists' Congress at Copenhagen.' The congress was formally opened in the Danish Houses of Parliament on May 25th, under the presidency of Dr. E. Hartert, and members were present from thirty-two different countries, Britain, Denmark and Germany being most strongly represented. An attractive programme of lectures and excursions was drawn up, and the lecturer gave a brief synopsis of those he attended.

Mr. Riley Fortune exhibited a number of lantern slides forwarded by Mr. W. J. Clarke, and including a series of a Blue-throated Warbler which first visited Mr. Clarke's garden on November 15th, 1925, and was last seen on September 19th after remaining through the winter.

Several photographs of uncommon fish were shown, including an 8½ feet specimen of the Porbeagle Shark; a 4½ feet specimen of the rarer Blue Shark which was stranded on Filey Brig, on December 4th, 1925; a Starry Ray from the Scarborough fish market; a Red Gurnard, the only example of this species that Mr. Clarke had seen from the Yorkshire Coast, and a Worm Pipe fish, 3½ inches long, caught at the extreme low tide mark on July 30th, 1925.

Photographs were also shown of a Dipper's nest which for the last four years had been built in a tree trunk, although suitable rocky sites were available; of two Dippers' nests built close together where a single nest has been observed for the last forty years, and of a remarkable Chaffinch's nest which was normal in form until the young were hatched, when strong northerly winds were experienced. The birds temporarily erected a wind screen of hair and feathers which protected the north side of the nest and extended half way over it.

A paper was read by Mr. R. Chislett on 'First Impressions of Lapland,' in which he described his experiences in a country where many of the British winter visitors nest, and where there is great scope for the ornithologist.

Lapland, the most northerly province of Sweden, is characterised chiefly by granite and other metamorphic rock with immense deposits of sand and other detritus, largely overlain with peat. Some of the hills are practically solid iron ore, and prosperous isolated communities have sprung up around them. A few miles away the Lapps, wearing their picturesque costumes, hunt the Reindeer, fish in the rivers, and live under primitive conditions.

During twenty-three days of wandering the lecturer and his wife met nobody, except in the vicinity of the railway, and found the limitless stretches of forest and marsh rather overpowering. As the sun never set, photography was possible right through the night.

The first nests of the Brambling were found in the forests, usually in the forks of Birch trees ten or fifteen feet from the ground, and the nests were larger and less tidy than those of the Chaffinch. The Mealy Redpoll built in the lower Birch and Willow scrub, and both the Redwing and Fieldfare were in evidence. The nest of the former closely resembled that of a Blackbird, and was generally low down, but the Fieldfare selected a site similar to that of the Missel Thrush, and the nests were very similar. A fine series of photographs was obtained of the former species, but, unfortunately, the nests of the latter were raided, probably by Hooded Crows. In the thinner parts the Willow Grouse nested, and the nests and eggs were found to closely resemble those of the Red Grouse.

Where the woods and marshes met, the Lapland Red-spotted Bluethroat was plentiful, and the nest, closely resembling that of a Pipit, was built in the low scrub. The song of this species is both varied and beautiful,

and has earned for it the Finnish name of 'The Voice of a Hundred Tongues.'

In the swamps, sheets of water were interspersed with ridges of dry ground covered with moss and creeping plants. The water was generally about 18 inches deep, and the bottom frozen hard. Cold weather was easily endured, but warm weather brought forth plagues of mosquitoes, and veils, gauntlets and puttees were absolutely necessary.

A few Cranes nested in the swamps, and though one was seen in the distance no nest was found, but a brood of Wood Sandpipers was discovered. A pair of Temminck's Stint was frequently observed on one patch of ground, and eventually a nest was found which eventually proved to be that of the Broad-billed Sandpiper. The nest was in a very wet part of the marsh, and the eggs were ruddy brown all over. Several photographs of this species was shown, and is believed to be the only ones in existence.

Occasionally a queer reedy knocking sound was heard over the marshes, and this was the love song of the Jack Snipe and extremely difficult to locate. The lecturer had the great fortune to discover a nest of this species and to obtain a series of photographs of the bird; unfortunately at the time of his last visit the eggs were still unhatched, and it still remains for somebody to furnish the first description of the young of this species. The Ruff, Hen Harrier, Tufted Duck, Mallard, Common and Velvet Scoter, Teal, Dusky Redshank, Red-necked Phalarope and Grey-headed Wagtail were also observed.

An expedition was made to Lake Tornetrask and the neighbouring mountain ranges. Here the Rough-legged Buzzard, Merlin and Raven were seen, and higher up the Ptarmigan, Wheatear and Golden Plover. The half-eaten remains of a young Reindeer brought to mind Wolves, Bears and Gluttons. A few pairs of Snow Buntings nested among the snow drifts, and on one occasion the lecturer nearly trod on a sitting Dotterel which was readily photographed without cover. On attempting to stroke her she raised her wings above her back and ran about in circles uttering a shrill twittering cry before returning to her eggs.

Near a mountain tarn was found the solitary egg of Buffon's Skua, a species largely dependent on the Lemming for food. The two central tail feathers are six to nine inches longer than the others, and vibrate incessantly in the breeze. On returning a few days later the egg had hatched, and the young resembled a ball of grey down. The flight is very dexterous, and it frequently describes 'figures of eight' in the air.

The lecturer stated that five of the adult species photographed were, he believed, done for the first time in their breeding haunts by a British photographic naturalist.

The wonderful and unique series of slides illustrating this paper was much appreciated, and in conclusion a hearty vote of thanks was accorded to the lecturers and the lanternist.

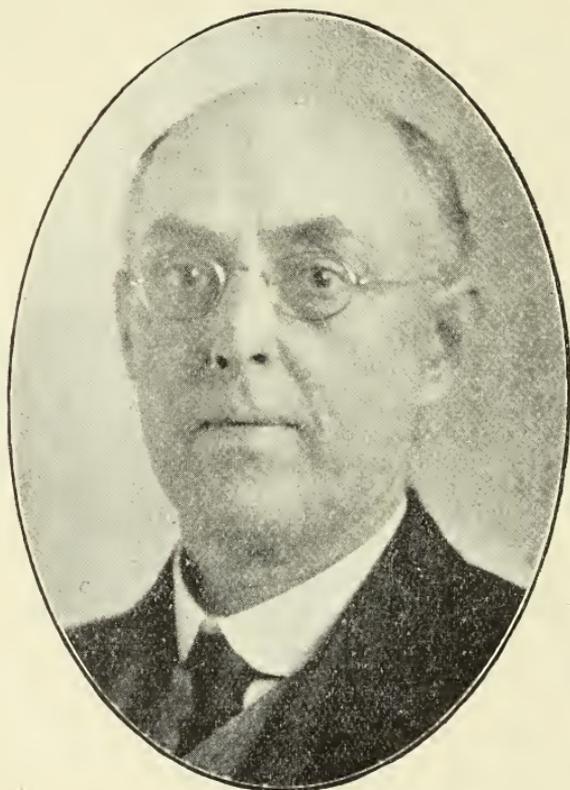
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**Nature, Thought and Personal Experience**, by **W. Tudor Jones**. London: Williams & Norgate, Ltd., xi.+182 pp., 7/6 net. In this instance we cannot do better than give the publisher's own account of the nature of the volume: 'Dr. Tudor Jones presents views of the universe and of life as these are to be found on three levels within human consciousness. His argument shows how man is meant to pass from the level of Things to the level of Thought, and from the level of Thought to that of Personal Experience. The contributions of the various branches of the natural and the mental sciences are shown, if followed to their ultimate conclusions, to point to a Personal Experience which is cosmic and spiritual in its nature and, finally, which includes the existence and presence of a Divine Spirit within the universe and within the human soul.'

## In Memoriam.

GEORGE GRACE, B.Sc., A.R.C.S., F.E.S.

THE sudden death of Mr. George Grace came as a shock to a very wide circle, and especially so to the members of the Keighley Naturalists' Society, to whom he had just delivered one of his characteristic lectures on 'The Aims of Science.' His closing words expressed his own temperament 'To the man with scientific knowledge, the world grows more wonder-



ful and more beautiful every day as his knowledge gets deeper and deeper, and to him, more perhaps than to any other type of man, nature offers ever increasing sources of delight and pleasure, which are never exhausted so long as life and health continues.' Half an hour later he was called to leave the world he found so much to delight in.

Mr. Grace was a native of Keighley, and 58 years of age. At the Keighley Trade and Grammar School he won a Devonshire Exhibition which took him to the Royal College of Science. He returned to his old school at Keighley as a teacher, and soon after became the head of Doncaster Technical School. Here he made the acquaintance of Hy. Culpin, and

in this journal and others, geological papers appeared under their joint names. He next went to Barrow as Head Master of the Barrow Technical School, and here he studied the effects of the Ice Age in the southern part of the Lake district, and in conjunction with Mr. F. H. Smith, wrote an important paper on 'The Glacial Geology of Furness,' which he read before the Yorkshire Geological Society.

On his retirement he went to live in Bournemouth, and at this time he appears to have been attracted more strongly to the study of Entomology. The desire to be of service to the country during the war was the means of bringing out his wonderful lecturing ability. He undertook lecturing at the Y.M.C.A. rooms for the troops, and these proved so successful that at the end of the war he decided to continue lecturing professionally, and by means of the Lecture Agency Ltd., the Y.M.C.A., and Suburban Lectures, he became well known as a lecturer on nature subjects and made a host of friends all over the kingdom. One of his most popular lectures he termed 'The Romance of Insect Life,' which he delivered over 200 times. Other lectures that he gave many times were 'Flowers and Bees,' 'Camouflage in Nature,' 'Insects and Man,' 'Glorious Devon,' and later 'Flies and their Relations.'

The last was the outcome of his study of Diptera, more especially the Chironomidæ. His interest in these midges commenced soon after the Annual Meeting of the Union, when Mr. Percy H. Grimshaw, in his Presidential Address, dealt with Diptera, and stressed the value of workers taking up the study of single groups or families. Mr. Grace decided to deal with this family, and very soon realized the difficulties of beginners owing to the varying terminology used by different writers, and his last paper in *The Naturalist* was written to give to other beginners the benefit of his extensive reading and studies. He decided that the available literature on the Chironomids, which was difficult to obtain, was not very helpful, and he commenced to study the British forms and to formulate a series of tables to aid the grouping of the genera and species.

To do this he commenced to make an enormous number of measurements of the antennal and leg parts to obtain information as to the amount of variation in the individuals of the various species; and also for use in identification, in conjunction with Mr. F. W. Edwards, he had in preparation a paper on these insects, which we trust will be found complete enough for publication on Mr. Edward's return from Patagonia. By his kindness and desire to help he attracted younger workers to this particular study, and his nature lectures must have been the means of making many see the wonders nature

holds in store. To Mrs. Grace, who helped him in his work, and coloured so many of his wonderful lantern slides, we offer our deepest sympathy in her sudden and great loss.—C. A. C.

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LEONARD GAUNT.

(1859-1926).

THE passing of Leonard Gaunt robs the Yorkshire Naturalists'



Union of one of its oldest members. He was elected a member of the Union as far back as 1883.

The Vertebrate Zoology Section, and the Yorkshire Wild Birds and Eggs Protection Committee, on both of which he was an active worker, have by his death lost one of their most valued members. He was one of the founders of the Protection Committee, a regular attender at its meetings, and one of its most generous financial supporters. He was also, for a long time, a member of the Leeds Naturalists' Club, and the Bradford Natural History and Microscopic Club.

His main interests in natural history was in Vertebrate

Zoology and especially in Ornithology. In his younger days he was an ardent collector,

Despite a physical disability he, when a young man, in pursuit of his loved studies, made an arduous pilgrimage to Iceland, from which he derived a rich store of knowledge, and specimens of both birds and eggs. His collection of eggs was large and valuable, and contained the collection of varieties of the Guillemot made by the late Dr. Bendelack Hewetson, which he purchased.

He had a passionate love for the beauties of Wharfedale, and spent a considerable portion of his time in the investigation of its fauna, his chief hunting ground being in the higher portions of the valley from Bolton Abbey upwards, more especially in the neighbourhood of Kettlewell, where he had a house.

In politics he was a liberal, and he was a member of a numerous and well known business family in the neighbourhood of Stanningley, and was himself head of John Hainsworth and Sons, of Cape Mills, Farsley, the well-known manufacturers of uniform cloths.

The writer, in common with especially the older members of the Union, feels deeply the passing of an old and valued friend, and the regrets are only tempered by the faith that is only to a higher and happier existence.—R. F.

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**The Adventures of a Lion Family, and Other Studies of Wild Life in East Africa**, by **A. A. Pienaar**. London: Longmans, Green & Co., xv.+256 pp., 4/6. The publishers have reprinted this work and issued it at a cheaper rate in the hope that it may appeal to a wider circle of readers. It gives an account of the larger game to be met with in the African forests, and the book is remarkable as being the work of a young man still on the right side of thirty.

**Grass**, by **Merian C. Cooper**. London: G. P. Putnam's Sons, xx.+362 pp., 10/- net. Those who saw the extraordinary film entitled 'Grass,' depicting life in the Baktyari country, with the extraordinary migrations by the tribes, which take place in search of food, will be glad to get this pictorial record of the film. The method of transport over a difficult, and, in some cases, ice-covered country are very well portrayed. There are altogether sixty-four reproductions from photographs by E. B. Schoedsack, which are 'full page' indeed, as there are no margins at all.

**Country Life and Sport**, by **J. Fairfax-Blakeborough**. London: P. Allen & Co., viii.+274 pp., 10/6 net. Few writers are more popular in the north than the author, whose articles in the various newspapers have long been appreciated by lovers of sport and country pastimes. Some of his more interesting writing is recorded in the present volume, which is illustrated from charming sketches by Lieut.-Col. B. Granville Baker. The very readable volume is made up of the following interesting articles: In Arcady; Evolution in Arcady; The Passing of the Squires; Game Birds and Cock-Fighting; Amongst Farmers and Stockbreeders; Foxhunting, Foxhounds and Foxes; Horses, Horse Men and Horse-manship; Country Conversations; and Our Village Flower Show.

## CORRESPONDENCE.

## ARTIFICIAL DISTRIBUTION OF MOLLUSCA.

Everyone will, I think, sympathise with Mr. Gyngell in his dislike of upsetting our natural fauna and flora by introducing species or varieties which are not indigenous. But there is more to be said on the other side than he allows. If one of our objects in studying the geographical distribution of races and species is to try and find out why some things live in one place and some in another, sooner or later one generally comes to the question: is so-and-so absent from this place because it has never got here or because it has been unable to live here? The only possible chance of answering that question is experiment, and whether one is prepared to disarrange things or not depends on the importance one attaches to the answer. The question which his implantation of sinistral *Limnaea peregra* into a pond at Scarborough is designed to answer is, I take it, whether this rare abnormality can live in any average pond in which it might happen to arise, or whether the three ponds in which it has been known to occur in some numbers have something in their make up which enables it to survive in them better than in other places. To my own mind, the answer to this question seems important enough to justify his experiment, especially as it was at Scarborough that Alderman Bean first found sinistral *peregra* nearly 100 years ago. Done with some such definite object, such experiments are proper and might well be made much more freely. But it is a necessary condition that they should adequately be recorded. This Mr. Gyngell fails to do, for he tells us neither where the specimens came from nor where the pond is into which he put them. For his consolation I will say that I have been trying for the past four years to get sinistral *peregra* (descended from those in the King Lane Pond at Leeds) to establish themselves in a number of ponds in the parish of Aldenham in Hertfordshire, so far without the least success.—A. E. BOYCOTT.

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## REVIEWS AND BOOK NOTICES.

**My African Neighbors: Man, Bird and Beast in Nyasaland**, by **Hans Coudenhove**. London: Jonathan Cape, Ltd., xiv.+245 pp., 12/6. Nyasaland is not so well known from the point of view of its fauna as other areas in Africa, and the author gives an account of the human beings there, the Nyasaland cat, monkeys, apes, mongoose, ants and other representatives of the fauna of the forests. He pays particular attention to folklore and ethnographical subjects, and, altogether, makes a very readable narrative as the result of living in that interesting area.

**A Bipolar Theory of Living Processes**, by **G. W. Crile**. London: Macmillan & Co., xv.+405 pp., 21/- net. By the aid of numerous coloured plates and diagrams, as well as innumerable illustrations in the text, the author gives results of his researches which he has had continually in progress since 1898. He was first induced to take up this line of study by watching a dying patient in one of the hospitals, and on the death of the patient he asked what had caused the heart to fail. 'It was not hemorrhage, but it appeared to me that failure of the circulation, to whatever it was due, must have been the primary cause of death, and this belief directed the course of my initial studies.' In endeavouring to account for this, the special studies now so minutely described and so excellently illustrated, were carried out. The Bipolar Theory of Life; Bipolar Nature of Protoplasm; The Bipolar Functions of certain Organs; The Bipolar Interpretation of Cancer, are subjects which must be studied in the volume itself.

**The Nervous Mechanism of Plants**, by **Jagadis Chunder Bose**. London: Longmans, Green & Co., xix.+224 pp., 16/- net. As readers

of our journal are aware an extraordinary amount of useful work has been accomplished in recent years dealing with the nervous mechanism of plants, and the Director of the Bose Research Laboratory, Calcutta, now gives the results of his work since 1900, in which year, at the International Congress of Science in Paris, the discovery was made of the electric response of non-living matter, such as metals, to stimulus. 'The response, like that of living matter, was shown to exhibit fatigue under continuous stimulation, enhancement under chemical stimulants, and permanent abolition under poisons. These results indicated that the response of the more complex and unstable living matter is ultimately the expression of physico-chemical reactions.' Sir Jagadis then continues with detailed accounts of his researches, which are described in seventeen chapters. He concludes that it can no longer be doubted, at any rate, vascular plants possess a well-defined nervous system.

**Nomogenesis, or Evolution Determined by Law**, by L. S. Berg. London: Constable & Co., Ltd., xviii. + 477 pp., 28/- net. The Professor of Geography in the State University of Leningrad has produced a work which will appeal to students of Biology, and we are indebted to Mr. J. N. Rostovtsov for the translation from the Russian to English, and to Messrs. Constable & Co. for the publication of a work which otherwise would be inaccessible to a large number of English students. As showing the thorough way in which the work has been done, there is a list of literature cited, which occupies no fewer than twenty-four pages, and there is a particularly good index. Professor D'Arcy Thompson introduces the book to the English reading public, and we cannot do better than quote his conclusions: 'Professor Berg holds views of his own, with many of which many of us are little likely to agree. But his book is always interesting; and he himself is so modest, so candid, so careless of credit and priority, that we may differ from him and still be friends. He tells us much of recent Russian work, of which we know all too little, and of some of which we might not otherwise have heard; and this adds in no small measure to the value of the book. Russian science is a very great thing; we could ill do without it, we were the poorer when it was eclipsed, we rejoiced in its vigorous resuscitation. I, for one, am grateful to Professor Berg for his original and suggestive book.'

**The Changing Face of England**, by A. Collett. London: Nisbet & Co., Ltd., x. + 290 pp., 10/6 net. This is written for the general reader, and the geological, geographical, and other changes made on the surface of the country as a result of atmospheric and tidal wear and tear are described. The author also deals with the work of rivers and the changes in the aspect of the country due to man's influence as well as the effect on the fauna and flora due to polluted atmosphere, the extension of towns and villages, drainage, and other causes. He has chapters on Shore, Storm and Tide; Reeds and Rushes; The Wrinkled Hills; Cattle-Tracks and Motor Highways; Race and Language; and so on.

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A Labrador Falcon, the first recorded for Britain, taken in the Pentland Firth, in July, has been added to the collections in the Royal Scottish Museum, Edinburgh. According to *The Scottish Naturalist* for September-October, it is the first record for Europe.

Writing in *The Murrelet* (Washington) for September, T. H. Scheffer records 'when making a raid on the English sparrows at Payallup, in April, we discovered one nest in which there were four young sparrows nearly fledged, but weakened and unable to fly. Imbedded in the skulls of each one were several larvæ of a parasitic fly about ready to pupate. These proved to be *Protocalliphora hirudo* var. *cuprea*. It will be interesting to check such infestation may have on the increase of this undesirable bird.'

## NEWS FROM THE MAGAZINES.

Mr. J. M. Brown favours us with a reprint of his paper 'On some Collembola from Mesopotamia' (*Linn. Soc. Journ. Zool.*, Vol. 36).

Some interesting records of birds ringed in Germany, Denmark and Finland, and subsequently caught in Great Britain, occur in *British Birds* for November.

We have received from Mr. Hans Schlesch a pamphlet on 'Nachtrag und Berichtigungen zu meinem Beitrag zur Molluskenfauna von Schleswig,' reprinted from *Archiv für Molluskenkunde*, LVIII., 1926.

*Nature* points out that recent press announcements with regard to the discovery of a wonderful skull at Trinil, in Java, show that its importance has been over-rated. Apparently it is not a skull at all, but a 'cast in spongy stone of volcanic origin.'

According to an article in *The Medical Herbalist* for November, Slippery Elm bark is worth its weight in gold. From the same journal we learn that 'the fluid extract of the flowers of Elder Flowers when made into a warm infusion is diaphoretic and gently stimulant, in cold infusion, diuretic, alterative and cooling.'

The Autumn Number of *The Geographical Teacher* contains a large quantity of valuable material, including the following three items of special interest: 'Ancient and Modern Land Measurements,' by Sir Henry G. Lyons; 'The Isle of Purbeck,' by S. H. Reynolds; and 'Regional Surveys and Scientific Societies,' by Sir John Russell.

We learn from *The Medical Herbalist* that 'Columbo root is bitter, aromatic, stomachic, anti-emetic, and astringent. It has been advised in dysentery, in serious diarrhoeas and bilious fevers. Used in dyspepsia, chronic diarrhoea, and dysentery; in convalescence from febrile and inflammatory diseases, hectic fever, and in the muscular debility of young children. Like other strong bitters, it occasionally checks the remittant and intermittent fevers of hot climates. The absence of irritating properties renders it also an appropriate tonic in the hectic fever of phthisis and other kindred affections. It is frequently administered in combination with other tonics, aromatics, mild cathartics and antacids.'

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## PROCEEDINGS OF SCIENTIFIC SOCIETIES.

*The Annals of Archaeology and Anthropology* issued by the University of Liverpool, published in October, are largely occupied by an excellently illustrated memoir on Oxford Excavations in Nubia, by F. L. Griffith.

*The Annual Report of the Art Museum of Nottingham* contains a record of a number of additions under the headings of: Pictures, Drawings, Engravings; Textiles; Jewelry; Ceramics; Sculpture; Coins and Medals; and Miscellaneous.

*The Report of the Scottish Marine Biological Association* for 1925-26 is a record of excellent work accomplished. This Society, like many others, we regret to find, is in urgent need of funds, and a special effort is being made to obtain subscriptions.

*The Proceedings of the Liverpool Naturalists' Field Club* for 1924 and those for 1925 have been sent to us. The former contains the first Presidential Address of Mr. W. S. Laverock on 'Switzerland: Its Flower, Field and Rock Gardens.' The proceedings for 1925 contain his second Presidential Address on 'Nuts and Berries.' There are portraits and 'In Memoriam' notices of W. H. Holt and D. E. Connor, and both Reports contain detailed accounts of the excursions held by the Club, and records of the botanical and zoological finds which were made.

## NORTHERN NEWS.

Mr. W. Robertshaw has been appointed Curator of the Bolling Hall Museum, Bradford.

Part LX. of Buckman's *Type Ammonites* includes illustrations of *A. hilderensis* from Whitby.

A. A. Schaeffer, Professor of Zoology at the University of Kansas, describes thirty-nine new Marine and Freshwater Species of the 'Amebas,' in Volume XXIV. of the publications of the Carnegie Institution of Washington.

At the recent annual meeting of the Lincolnshire Naturalists' Union held at Lincoln, the president (the Rev. Sumner C. Wood) presiding, Mr. H. Wallis Kew was elected president. In appreciation of his twenty-one years' service as hon. secretary, it was decided to present Mr. Arthur Smith with an honorarium.

Our former contributor, the Rev. Hilderic Friend, has presented his collection of Earthworms to the British Museum; and to the Biological Department of the Birmingham University he has given a large quantity of tubes of oligochaetes and water worms, 'some of them type specimens and quite unique.' Type specimens should be.

Through the generosity of one of our contributors, a number of copies of the plate containing the portrait and signature of the late G. W. Lamplugh, appearing in this issue, have been struck off, and will be forwarded to anybody who would like one, on receipt of postage. Application should be made to The Museum, Hull.

The Southern Railway has recently issued a Fifth Edition of the charming pamphlet on 'The South Downs,' with coloured and other illustrations of the scenery which is such an attractive feature of the South-east Coast. The pamphlet contains nearly one hundred pages and a map, covers the area between Bognor and Eastbourne, and is sold at 1/3 net.

The City of Stoke-on-Trent has issued a Short History of Staffordshire Pottery, and the Report of the Corporation Museums, for 1925-26, prepared by the Curator, Mr. F. Lambert. Each is well illustrated. Apparently the wonderful collection of pottery is being distributed in the various Staffordshire Museums, so that each one contains certain special collections rather than a little of everything.

The British Museum (Natural History), South Kensington, has issued two further sets of beautifully coloured postcards illustrating British Sea Birds, and leaflets with descriptions of each species. Seasonal changes of plumages are illustrated, as well as immature birds where these are markedly different from the adults. There are five cards in each envelope (1/-), or the cards can be obtained separately at 2d. each.

Mr. Edgar P. Chance has circulated an 'Open letter to the members of the B.O.U. in reference to the "Crossbill Case."' He points out that he had resigned from the Union before the Committee requested him to do so. He complains that the Editor of *The Ibis* will not allow him to discuss the matter in the journal, and that some of the Committee who adjudicated on his case are themselves ardent collectors and have taken quite a number of Crossbill eggs.

Messrs. A. Brown & Sons have recently published 'The Official Guide to Kingston-upon-Hull,' issued under the authority of the City Council, containing 66 pages, and of suitable size to put into one's pocket. The Official Guide previously issued was so large, and as new editions with additions were called for, eventually became cumbersome. The present publication is compiled under the direction of Mr. H. E. C. Newham, and has valuable historical and other notes, as well as a plan. There are naturally advertisements in the volume, but these have thoughtfully been printed on a tinted paper so that they can readily be removed without interfering with the rest of the publication.

# 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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## CORRIGENDA.

1925—

- Page 111, line 9 down, for 'Oxynotidæ' read 'Oxynoticeratidæ.'
- „ 137, line 2 up, and page 139, line 12 down, for '*Xiphoceras*' read '*Præderoceras*.'
- „ 139, line 10 down, delete comma after 'ornamentation.'
- „ 169, footnote 2, for 'C88980' read '88980.'
- „ 170, footnote 4, for 'Pl. 4' read 'Pt. 4.'
- „ 170, footnote 9, for 'XXVII., fig. 18' read 'XLIX., fig. 27.'
- „ 172, line 6 down, after '*Epideroceras*' insert 'Beds.'
- „ 265, line 6 up, for 'C13124' read 'C3124.'
- „ 265, footnote 6, for 'fig. 2a only' read 'fig. 2.'
- „ 301, text fig. 8d, for '17670' read '17160.'
- „ 330, lines 1 and 2 up, transpose.
- „ 360, footnote 1, for '*neera*' read '*nera*.'

1926—

- Page 50, headline, for "Diptera," read "Aptera."
- „ 158, Line 28, for 'Pliney,' read 'Pliny.'
- „ 277, under block, for 'F. W. Mason,' read 'F. A. Mason.'
- „ 297, second headline, for '*Apatelous*' read '*Apetalous*.'
- „ 322, line 8 up, for '*Palassiceras-Virgatites*' read '*Palassiceras-Virgatites*.'
- „ 324, line 3 up, for '*Konigi*' read '*königi*.'

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