JAN. 1920. No. 756
(No. 530 of current Series).

THE NATURALIST

A MONTHLY ILLUSTRATED JOURNAL OF

NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

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

Contents :—

LONDON:
A. BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.
Printers and Publishers to the Y.N.U.

Price 9d. net. Prepaid Subscription 8/6 per annum.

BOOKS WANTED.

Alford Nat. Hist. Soc. Reports. Set.
Barrow Nat. Field Club Trans. Vol. VII.
Bath Field Nat. and Arch. Soc. Vols. VIII.-XI.
Bedfordshire Natural History Society Proceedings. Set.
Birmingham Nat. Hist. and Phil. Soc. Proc. Vol. I., part 2.
Brighton and Sussex Natural History Society Reports, 1870, 1872-3.
Burnley Lit. and Sci. Soc. Parts 8, 12, 13, 16-27, 29-
Chester Soc. Nat. Science: Ann. Reports, i.-iv.
Cleveland Lit. & Phil. Soc. Trans. Science Section or others.
Croydon Nat. Soc. 6th Report.
Dudley and Midland Geol. etc., Soc. Vols. II.-IV.
Discovery. (Liverpool, 4to). 1891.
Derby Arch. and Nat. Hist. Soc. Parts 20, 21.
Devonshire Assoc. Adv. Science. Vols. I., II., III., XXXV., 47-
Dublin Geol. Soc. Vol. I., pt. 1, 1830?; Vol. VII., parts 1-3 (or complete Vols.). 1855.
Eastbourne Naturalist (1 part).
Eastbourne Nat. Hist. Soc. Vols. II.-III. (or parts), and part 6 of new series.
Edinburgh Geol. Soc. Vol. III., part 3; Vol. IV., part 1.
Frizinghall Naturalist. (Lithographed). Vol. I., and part 1 of Vol. II.
Garner. No. 60.
Geol. and Nat. Hist. Repository, Mackie's. Vols. II., III.
Geol. Assoc. Proc. Vol. I., Part 1.
Geol. Soc., London, Trans. 4to. 2nd series, Vols. IV.-VII. Pts. 1-3 (1836-52).
Geol. Soc. Quarterly Journal. Parts 5 and 7.
Geological Magazine, 1890-1-2-4.
Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).
Illustrated Scientific News. 1902-4. (Set).
Journ. Micrology and Nat. Hist. Mirror. 1914—
Keighley Naturalists' Society Journal. 4to. Part 1.
Kendal Entomological Soc. 3rd Report.

Apply—**Editor, The Museum, Hull.**

BOOKS FOR SALE.

Rambles of a Canadian Naturalist. Coloured Illust. S. T. Wood. 3/6
How to Lay out Suburban Home Grounds. Kellaway. (Pubd. at 8/6). 3/6
What is Instinct? C. Bingham Newland. 2/6
Vigour and Heredity. J. Lewis Bonhote. 6/6
White's Natural History of Selborne. Coloured Illustrations by Collins, 6/-
Rambles in the Vaudese Alps. F. S. Salisbury. 2/-
Trans. Manchester Geol. Soc. Vol. I., 5/-.
Jewitt's Reliquary. Vol. III., 3/6.
Lee's Note Book of an Amateur Geologist. 4/6.
Extinct British Animals (with account of White Wild Cattle). J. E. Harting. 6/-
Glimpses of Indian Birds. By D. Dewar. 3/6
Birds of Calcutta. By F. Finn. 1/6
Hitchcock Religion of Geology. 2/-.
British Organic Remains (Geol Survey). Decades I., II., VII., 1/6 each.
Hunting in British East Africa. Madeira. 10/-
Spencer Fullerton Baird. By Dall. 7/6
The Greatest Life. Leighton. 3/-.

Published Records of Land and Fresh-Water Mollusca, East Riding. (Maps). T. Petch, B.Sc., B.A. 1/6
Diatomaceæ of Hull District. (600 illustrations). By F. W. Mills, F.R.M.S. and R. H. Philip. 4/6

Apply—**Dept. C, c/o A. BROWN & SONS, Ltd., Hull.**

WANTED.—Three copies each of *The Naturalist* for February, March, April, 1919. **1/-** each offered.

Apply—**Editor, The Museum, Hull.**

THE NATURALIST

FOR 1920.

NOTES AND COMMENTS.

NATURE.

No. 2610 of *Nature* is a jubilee number in commemoration of the completion of a half century of this successful journal. It is a considerably enlarged issue, and gives well written summaries of the progress of various branches of Science by our greatest living authorities. We do not propose to enumerate them all, but the following articles appeal particularly to us :— 'Retrospect and Prospect,' by Sir Archibald Geikie ; 'The Foundation of Biological Sciences,' by Sir E. Ray Lankester ; 'The Expansion of Geology,' by Prof. T. G. Bonney ; 'The New Birth of Medicine,' by Sir T. Clifford Allbut ; 'The Antiquity of Man,' by Dr. A. Smith Woodward ; 'The Progress of Mendelism,' by Prof. W. Bateson ; 'Progress of Geography,' by Sir John Scott Keltie ; 'The Reproduction of Illustrations (1869-1919),' by Mr. Emery Walker ; 'The Promotion of Research,' by Sir Richard A. Gregory. We should like to congratulate *Nature* on its progress and on the distinct impression it has made on the advancement of Science in this country. With this number is given an excellent portrait of Sir Norman Lockyer, who has been the editor since the first number of the Journal.

HIBERNATION OF HOUSE-FLIES.

Writing to *The Times*, Mr. C. J. Gahan, of the British Museum (Natural History), states that 'M. Séguy had proved by experiment that larvæ of the house-fly will readily penetrate the closed diaphragm of the shell and entirely devour the snail inside, and, having destroyed one snail in its shell, will then pass on to consume another. To those who are familiar with the extraordinary habits of various fly larvæ there is nothing astonishing in these results. They but prepare the way for an acceptance of his statement that larvæ of the house-fly had been obtained from nine of 50 snails, which were collected in the middle of January last from a wall close to a military hospital. This remarkable and most important discovery needs to be confirmed ; and, as it is very desirable that further observations should be made on as wide a scale as possible, in order to determine to what extent, if any, this larval habit may help to account for the prevalence of house-flies in the summer, I should be very glad if any who are interested, and have the opportunity to do so, will be good enough to collect snails in the coming winter and send them to me here for investigation in the Insect Department.'

THE SACRED BEETLE.*

This is another of Fabre's beautiful word-pictures—brim full of valuable observations, true stories more fascinating than any fiction. 'All these favourites of instinct prepare board and lodging for their offspring. They become master-craftsmen in a host of trades for the sake of a family which their faceted eyes will never behold, but which is nevertheless no stranger to the mother's powers of foresight. One turns cotton spinner and produces cotton-wool bottles; another sets up as a basket-maker and weaves hampers out of bits of leaves; a third becomes a mason and builds rooms of cement and homes of road-metal; a fourth opens pottery works, where clay is kneaded into shapely vases and rounded pots; yet another goes in for mining and digs mysterious underground chambers in the warm, moist earth. A thousand trades similar to ours and often unknown to our industrial systems enter into the preparation of the abode.'

THE BOOK OF A NATURALIST.†

Another charming book issued by the same publishers, makes its appearance under the above title—though the author would have preferred another—but unfortunately all his suggested titles had recently been used. Mr. W. H. Hudson, well-known to our readers as the author of 'The Naturalist in La Plata,' gives a well-written series of papers—the results of the observations of a keen field naturalist, some of which had recently appeared in some of the journals and are here reprinted. Mr. Hudson converses on a variety of subjects—and in addition to giving first-hand field observations, tells some remarkably good stories, his chapter on "My neighbour's bird stories,' being a fair sample. Among the twenty-nine chapters there are 'Hints to Adder-Seekers,' 'The Discontented Squirrel.' 'The Toad as a Traveller,' 'The Heron as a Table Bird,' 'The Serpent in Literature,' 'Dogs in London,' 'Concerning Lawns and Earthworms.'

ANIMAL LIFE,‡

Under the auspices of the Imperial Studies Committee of the University of London, a series of nine public lectures was delivered at King's College, and was remarkably well attended. Their object was to bring before the public as convincingly as possible the claims of Zoological Science to recognition on terms of equality with other departments of learning. With

* 'The Sacred Beetle and Others,' by J. Henri Fabre; translated by Alexander Teixeira de Mattos. London: Hodder & Stoughton, 296 pp., 7/6 net.

† 360 pp., 12/- net.

‡ 'Animal Life and Human Progress,' edited by A. Dendy, D.Sc. London: Constable & Co., 227 pp., price 10/6.

this object in view the services of specialists were secured and the subject was dealt with in turn from various points of view.

AND HUMAN PROGRESS.

Under the genial editorship of Prof. A. Dendy, these lectures have been brought together in the present volume. The editor deals with ' Man's Account with the Lower Animals '; Prof. G. C. Bourne, ' Some Educational and Moral Aspects of Zoology ' ; Mr. C. Tate Regan, ' Museums and Research ' ; Prof. J. A. Thomson, ' Man and the Web of Life ' ; Prof. F. Wood Jones, ' The Origin of Man ' ; Dr. R. T. Leiper, ' Some Inhabitants of Man and their Migrations ' ; Prof. R. C. Punnett, ' The Future of the Science of Breeding ' ; Prof. W. A. Herdman, ' Our Food from the Sea ' : and Prof. R. Newstead, ' Tsetse-Flies and Colonisation.' Mr. Tate Regan says, ' At the present day the educational value of Museums is appreciated to a much greater extent than the fact that Museums are—or ought to be—centres of research, and that in a Museum of Natural History research may be more important than education.'

INSECT ARTIZANS.*

Adopting a somewhat similar theme to that of M. Fabre referred to above, our old friend, Mr. Edward Step, brings out a volume dealing with various interesting aspects of insect life, classified under the heads of Spinners and Weavers, Miners, Masons, Carpenters and Wood-workers, Upholsterers, Wax-Workers, Paper-makers, Tailors, Horticulturalists, Sanitary Officers, Musicians, Burglars, Lamp-bearers. With this classification the author describes many strange habits of insects—some fairly well known—others from quite fresh standpoints. The book is made more attractive by the 54 illustrations on art paper.

RHIZOPODA AND HELIOZOA.†

A melancholy interest attaches to this volume as it contains some of the last work of the Ray Society's energetic Secretary, John Hopkinson. The present part contains descriptions of British species recorded since the previous volumes were printed, and is largely the work of Mr. G. H. Wailes, of Sheffield, who has been much assisted by our contributor, Mr. J. M. Brown. Most of the specimens described are from the north of England—quite a large proportion being from Yorkshire. There are numerous illustrations, including some excellent coloured plates.

---

* ' Insect Artisans and Their Work,' by Edward Step. London : Hutchinson & Co., 318 pp., 7/6 net.

† ' The British Freshwater Rhizopoda and Heliozoa,' Vol. IV. (Supplement to the Rhizopoda), by G. H. Wailes, and Bibliography by John Hopkinson. Ray Society, pp. xii.+130.

EVOLUTION OF THE DRAGON.*

For three years Prof. Elliot Smith, of the University of Manchester, gave a series of lectures at the well-known John Rylands Library, in Manchester. These dealt with a wide range of subjects, but have been brought together under the title, 'The Evolution of the Dragon.' The first chapter, 'Incense and Libations,' points out that the dragon was primarily a personification of the life-giving and life-destroying powers of water, and it is concerned with this biological theory of water and its relationship to the other germs of civilisation. Chapter II. refers to Dragons and Rain Gods; and Chapter III. the Birth of Aphrodite. Prof. Smith has much to tell of ancient lore, and has obviously searched the records of many ancient civilisations in connexion with his theme. There are several excellent illustrations which add much to the clearness of the essays.

MOIR WHITE ELEPHANT.

In February, 1919, *Man* produced Mr. Moir's remarkable account of an alleged carved mammoth. In *Nature*, *Man*, and in *The Naturalist* it was fairly evidently shown by Dr. C. W. Andrews, Sir Henry Howorth and others that the alleged 'Great Glemham' carving was merely a natural cast of a chamber of a chalk Ammonite. This Mr. Moir would not accept, but promised a 'further memoir' on the subject. After ten months this 'Memoir' appears, in *Man* for December. After having seen some casts of ammonite chambers, Mr. Moir now admits that 'there cannot, I think, be much doubt that, *in its original form*, the piece of chalk from Great Glemham was the internal cast of a chamber of the shell of an ammonite.' He then endeavours to prove that some early man modified this cast in order to make it more like a mammoth, and naively concludes: 'Those who disagree with this opinion must bring forward specimens really comparable with the piece of chalk described by me, and be able to demonstrate that the nature of their forms, surfaces and provenance are such as to make the conclusion that these specimens are of natural origin inevitable.' He has taken advantage of a few recent elementary lessons in geology at the British Museum, has examined the 'pigs,' etc., there—but keeps his little pet elephant locked up lest a second authority should express an opinion. 'Surely,' in the interests of science—which is the object of Mr. Moir's 'researches'(?)—another opinion might be given—or have we come to the state, apparently shared by *Man*—that Mr. Moir's verdict is alone necessary—and final? Mr. Moir's microscopic methods of bolstering his case are

* By G. Elliot Smith. Longman, Green & Co., 234 pp., 10/6 net.

characteristic. Dealing with the ' post-cast history ' of the specimen he finds it has ' three surfaces of different ages,' *A*, ' a roughened area, apparently the most ancient surface ' ; *B*, ' an area exhibiting marked striations . . . having been produced by glacial action of some sort or kind ' ; *C*, ' presents a peculiar smooth and " characterless " appearance . . . partly the result of long exposure to the solvent action of vegetable or other acids.'

CHALK AND VINEGAR.

Three pieces of ' flocky ' and other sorts of chalk from different parts of the pit—apparently to coincide with the three forms of ' surfaces ' described above, are then selected, shaped and scratched with flint ' by me,' rubbed with the fingers and immersed in vinegar and water for some days. And by such scientific research—which only Mr. Moir would dream of—an attempt is made to prove to sane and educated people that a piece of a chalk ammonite is a man-made model mammoth, with eye, trunk, penis and all complete. And the editor of *Man* permits it to be printed !

THE NATURAL HISTORY MUSEUM.

We take the following from a recent impression of *The Times* :—' We learn that there are at present vacancies in the Entomological, Zoological, and Geological Departments of the Natural History Museum which have been open for several months, and that more vacancies are expected in the immediate future. The Museum is one of the great national instruments for the collection, classification, and preservation of specimens of the animals and plants, the rocks and minerals, of the world. For the adequate performance of its duties, it must have a full staff of able and devoted specialists. It should require no defence on utilitarian grounds, for the advancement of natural knowledge of the kind to which it is devoted is recognized as a privilege by every civilised State. But there are plenty of utilitarian arguments. Take entomology alone. The number of living species of insects is estimated at over 2,000,000, of which less than half a million have been described. The pressure of insect life on human life is continuous. As household pests, as carriers of disease, as enemies of stores or crops, they are every day being found to have an unexpected economic importance. It is to the experts and the collections of the Natural History Museum that we have to turn for the requisite information, and unless the Museum has an adequate staff we turn in vain.'

SALARIES.

' The difficulty in filling posts with suitable men is partly financial. The present rate of pay for assistants in the second

class is from £150 to £300, and in the first class from £300 to £500 a year, with a temporary war bonus. These salaries—the "despair" of Professor Stanley Gardiner—are no longer sufficient to attract or to retain men of the right attainments, unless they happen to have private means. The smallness of the staff and its inevitable division into water-tight compartments make promotion slow and capricious. These disadvantages are increased by an antique privilege of the Principal Trustees, who nominate candidates for vacancies instead of advertising for them. It has frequently happened in the past that middle-aged mediocrities have been brought in and placed over the heads of the existing staff because of their acquaintance with a group in which some of the Trustees are interested. The fact is that the mode of governance of the Natural History Museum is mediæval. It should be separated from Bloomsbury and placed under a body of Trustees selected not because they make a hobby of collecting bugs or butterflies, but because thay have a wide knowledge of the scientific purposes which it is the business of the Museum to subserve.'

THE GOVERNMENT AND THE MUSEUM.

From the same source we gather that 'The stagnant procrastination of the Government is damping down every effort of the nation to restore and to reconstruct, and the failure to release the British Museum is only one of its many deplorable effects. The Registry of Friendly Societies was displaced for the Ministry of Pensions, and is entrenched in the galleries at Bloomsbury. Lord Stanmore, replying to the Archbishop of Canterbury, one of the Principal Trustees, offered no hope. "It had been found to be quite impossible," he said, "to find accommodation elsewhere." The closing of the galleries damages science and damages the Empire. We cannot accept the excuse of the Office of Works that accommodation is not to be found. They have found accommodation for their own megalomaniac museum of the war, with its staff of new officials amassing a gigantic lumber of insignificant relics, the discards of other departments. They are even beginning to release hotels. Where a multitude of voters is concerned, there such small activity as the Government can exert will be employed. Hotel visitors and friendly societies are effective in polling and must be attended to. Passing soldiers, lovers of learning, and students of antiquity must wait. But surely the three Principal Trustees, the Archbishop of Canterbury, the Speaker of the House of Commons, and the Lord Chancellor, selected as the guardians of the national treasures, not because of their knowledge, but because of their exalted positions, are not going to be browbeaten by a minor Department?'

THE NORTH RIDING*.

For some years we have been familiar with the publication of a series of Cambridge County Geographies, written by experts, and previous to the War these were completed for most of the counties in Great Britain, with the exception of Yorkshire, which for some reason or other has remained until about the last, which is all the more remarkable in view of the extraordinary advantages that county possesses from a geographical point of view. It is now apparent that the gap is to be filled, and Captain Weston has produced a volume dealing with the North Riding from which it would appear that our county of broadacres will be described in three separate volumes, one for each Riding. We can only say that the author has succeeded in producing a book which will appeal to the geologist and naturalist as well as to the teacher. It is certainly far and above the average tourist hand-book. The illustrations are numerous and will recall to the reader the many beauties of one of the finest tracts of land in the country. A careful perusal of the volume enables us to disagree with the author on some minor points. There is a geological map at the end, though this does not seem to be quite up to the Cambridge University Press standard; in fact in parts it is quite misleading.

SOME MINOR POINTS.

For instance, we should hardly say (p. 6) that the Vale of Pickering was 'scooped out long ago by moving ice-fields.' The West Riding extends not merely 'over to the north side of the stream,' but beyond it (p. 13). The Ainsty of York does not 'constitute a county in itself,' nor has it since the Municipal Corporations Bill of 1835, when this area was transferred to the West Riding (p.14). The Castle of Richmond is not built on a 'mound' (pp. 14 and 115). In a work of this character it is a pity to mention 'Semmer Water' and not explain its origin (p. 28). The 'Lower Carboniferous' is not the 'coal-bearing division' (p. 31). It is hardly correct to say that the 'Millstone Grit' was formed from 'volcanic rocks,' nor to say 'there are no layers of coal in the North Riding.' And it is risky to say 'The later deposits, clays and sandstones, have been laid down in the Vale of York and Mowbray directly over the Millstone Grit,' and leave the Magnesian Limestone and 'New Red' out of the reckoning (p. 33). And one questions the statement that 'in Richmond, for instance, the hard cobbles that cover the streets are granite lumps transported long ago down Swaledale from Stainmoor.' Is

* By W. J. Weston, 161 pp. Cambridge University Press, price 2/6.

there any 'Boulder Clay' at Wass? And the statements *re* the 'artificial cutting on the face of the Castle Hill at Scarborough,' seem exaggerated (p. 35). It is good to know 'where the limestone begins one finds the lady's slipper.' But the 'Hole of Horcum' is not the only Yorkshire locality for *Cornus suecica* (p. 43). And again, on p. 40 to suppose 'that we had already received most of the animals and plants found in Europe' is rather much to swallow, and the statement on p. 41 that 'the badger is almost extinct' need not be taken too seriously. Where does the Millstone Grit easily split into roofing slates? (p. 121). The section on Agriculture contains a number of surprising statements, but the suggestion on p. 67 that the 'White-faced Leicester' was common in the North Riding, is doubtful, though the Blue-faced Leicester is, and in Allertonshire and along the lower waters of the Tees many Lincolns are kept. What the beasts illustrated on p. 67 are, passes one's comprehension. The omission of the names from 'The Roll of Honour of the County,' of Scoresby, Spruce, and William Marshall of Pickering, seems inexcusable.

LIVERPOOL BIOLOGISTS.

Vol. XXXIII. of the *Proceedings and Transactions of the Liverpool Biological Society* (158 pp., 10/6), contains an exceptionally interesting series of natural history memoirs. Prof. W. Ramsden's Presidential Address on 'Surface Films,' deals with many puzzling phenomena; Prof. W. A. Herdman follows with his thirty-second annual report of the Liverpool Marine Biology Committee, an appendix to which is his Address on 'Some Periodic Changes in Nature.' Prof. R. Newstead describes 'Some Scale Insects (Coccidæ) found in the Isle of Man.' Mr. G. Ellison writes on 'The Nest of the Bank Vole,' and 'A White Orkney Vole.' Mr. J. W. Cutmore, 'Some Notes on the Rats of the Port of Liverpool.'

LANCASHIRE SEA FISHERIES.

Then follows Prof. Herdman's Report on the year's work in connection with the Lancashire Sea Fisheries Laboratory and the Sea-Fish Hatchery at Piel. This includes the following interesting contributions:—'On the Monthly Occurrence of Pelagic Fish Eggs,' by A. Scott; 'Intensive Study of Irish Sea Plankton,' by W. A. Herdman, A. Scott and H. Mabel Lewis; 'The Dietetic Value of Sprats and other Clupeoid Fishes,' by J. Johnstone, and 'The Probable Errors of Bacteriological Analyses,' by J. Johnstone. The publication concludes with a remarkable note on 'Pearl-like Concretions in Tripe,' by J. Johnstone. By the way, if any of our readers can assist us in securing the *first* report of this Society (we have all the others) we should be very grateful.

WANDERINGS AND MEMORIES.

Messrs. Longmans, Green, and Co., under the above title, have published a series of delightful reminiscences from the pen of Mr. J. G. Millais (298 pp., 16s. net). The volume contains a fascinating record of some of the more interesting incidents in the life of Mr. Millais, which seems to have been as full of variety as the most adventurous of naturalists could possibly desire. Quite apart from the charm and excitement of the narratives, the volume is a remarkable record of the varied achievements of a sportsman in all parts of the world. We have accounts of many quaint incidents during the author's youth, his visits to Iceland, the Lofodens, the Arctic, while in his 'one African Day,' he achieved as much as the greatest big game hunter could possibly wish. As the book contains some thrilling experiences with the Germans during the recent war it will be seen that it is thoroughly up-to-date. Many of Mr. Millais' inimitable sketches are reproduced in the volume.

A NATURALIST'S SKETCH BOOK.

From the same publishers we have received a volume with this title, containing 60 plates by Mr. A. Thorburn, F.Z.S., many of which are coloured. It will be remembered that during the war Messrs. Longman produced Mr. Thorburn's volumes on British Birds at a price which we then feared would have been prohibitive. As illustrating the way in which the publishers were familiar with the market, not only was the edition sold out but further editions were called for.

SKETCHES AND PLATES.

The present volume, with its 60 plates and a similar number of pages of letterpress, is issued at 6 guineas, and quite apart from the beauty and artistic accuracy of the plates, we should, in pre-war days, unquestionably have prophecied a tremendous loss on the venture. We are now confident, however, that although the price works out at something like two shillings a plate, there will be quite a good demand for the book. It consists of some coloured plates of various animals and plants, but in addition are several rough sketches illustrating the care and fidelity with which the author has carried out his work. All are beautiful, but we think the view of the Germander Speedwell, on plate 59, is a perfect little gem.

THE LEEDS UNIVERSITY.

An outstanding matter of public interest at a recent meeting of the Court of the Leeds University was a statement made by the Vice-Chancellor (Sir Michael Sadler) with reference to the urgent need for increased accommodation and equipment. Pointing out that the University of Leeds was

typical of modern effort to develop the highest study and research and training in the humanities, pure science, applied science and medicine, the Vice-Chancellor reminded the Court that the number of students had doubled since the year before war broke out, and in almost every department there was no room for further admissions. If accommodation had been available they could have admitted many hundreds of deserving students whom they had had to turn aside. The Council looked to the future with confident hope, but at the same time with some concern, for the secondary schools of Yorkshire were now crowded; and there had never been so large an attendance in those schools. From them, each year, an increasing number of young people would come expecting admission to the University, and unless accommodation could be provided, the work done by the County and County Borough Council Education Committees would be foiled at its critical point. It was, therefore, necessary to consider how they were to furnish the University with the buildings, equipment, and staff in order to meet the greatly increased demands. With this object in view an appeal for £500,000 was made.

CARBONIFEROUS ZONES.

At the recent annual meeting of the Yorkshire Naturalists' Union Fossil Flora and Fauna Committee, Professor Kendall proposed that where collections are made from fossiliferous exposures in the Coal Measures that are vertically above colliery workings, the precise vertical height above the seam that is being worked should, if possible, be obtained by reference to 'spot-levels' upon the plans of the colliery. This would give much desired precision to the determination of the horizon.

———: o :———

Mr. E. F. Linton has prepared a 'second issue' of his **Flora of Bournemouth** (Bournemouth: H. G. Commin, 304 pp., 5s. 6d.), which seems to be practically the first issue (1900) with an appendix dated August, 1919 (pp. 287-304) with details of the additions made since the first edition. No doubt the book was for the benefit of the recent meeting of the British Association to Bournemouth.

We Must Discover. By **E.C.** London: Simpkin Marshall, Hamilton Kent & Co., 176 pp., 3s. 6d. net. This extraordinary book is the work of a keen enthusiast in the education of children and his scheme of twelve 'plays' is excellent in theory—but in practice we fear would be difficult to carry out. Still there are some clever ideas and we would recommend the book to teachers as they will certainly be able to get some useful hints, even if they do not carry out all the scheme. The book is brim full of apt quotations—and, in these times, we must thank the author for one (under 'Illusions') though we have perhaps taken it in a different way from that intended. It is, 'Beloved, believe not every spirit, but *try the spirits*,' 1 John, iv., 1.

NOTES ON THE FLORA AND FAUNA OF NORTH-EAST DERBYSHIRE.—II.*

ERIC DRABBLE, D.SC., F.L.S. AND HILDA DRABBLE.

WITH the exception of a paper by Mr. H. J. Burkill,† and one by Mr. J. M. Brown,‡ we are not acquainted with any literature dealing with plant galls occurring in Derbyshire. Mr. Burkill's paper deals with an area 'bounded roughly by a line drawn from Hindlow Station on the north, through Hurdlow and Parsley Hay Stations, Lathkill Valley, Stanton Moor, Grange Mill, Ible, Wirksworth, Weston, Underwood, Brailsford, Rodsley, Yeaveley, Norbury, Ellaston, Ramshorn, Winkhill, Morridge, Blakemere House to Longnor and Hindlow Station.' It thus relates to parts of Derbyshire and Staffordshire and nowhere encroaches upon the area defined by us in *The Naturalist*, January, 1919 (*loc. cit.*). Mr. Brown's records also are chiefly outside our area and to the west of it.

Mr. Brown does well to emphasize the need for a study of the distribution of galls in Great Britain. Only by the publication of local lists can a census be made. Many, no doubt, are ubiquitous, but galls excessively common in one district may not be so in another. Thus, that formed by *Perrisia crataegi* is very abundant everywhere in our area and is mentioned as being very common by Mr. Burkill and Mr. Brown in the areas worked by them. It is interesting, therefore, to notice that we failed to see this gall during our visit this summer to the south-west of the Isle of Wight. On the other hand, galls formed by *P. veronicae* and *P. urticae*, common throughout Derbyshire, were also found in the Isle of Wight.

That of *Cystiphora sonchi* on *Sonchus arvensis*, hitherto recorded only from the south of England, we have found abundantly in three localities in our area and a similar gall occurred on *Hieracium vulgatum*. The gall caused by *Eriophyes tiliae*, so far known only on *Tilia europaea*, we obtained on *T. platyphyllos* also, and that of *Perrisia veronicae* is recorded, apparently for the first time in this country, on *V. montana*.

Much remains to be done in determining the range of plants attacked by any one species of gall-former. It may be that some can produce galls on more than one species of plant. At the same time, the interesting work that has been done on the parasitic fungi which attack various species of *Bromus* and other grasses suggests the possibility of 'biologic races' amongst the gall-formers.

* Part I. in *The Naturalist*, No. 744, January, 1919, pp. 10-12.

† 'Plant Galls of Thorpe and District,' in *Journ. Derbys. Archaeol. and Nat. History Society*, Vol. XXXVIII., pp. 29-48.

‡ *The Naturalist*, No. 753, October, 1919, pp. 330-332.

Many problems of far-reaching interest arise, but here it is not possible to discuss them. We have confined ourselves to a mere list of galls observed within the area outlined by us in the first paper of this series.

FILICES.

Pteris aquilina L.
Diptera.—*Perrisia filicina* Kieffer (*Cecidomyia pteridis* Müller).
Athyrium Filix-foemina Roth.
Diptera.—*Anthomyia signata* Brischke.
Lastrea Filix-mas Presl.
Diptera.—*Anthomyia signata* Brischke.

CONIFERAE.

Taxus baccata L.
Diptera.—*Oligotrophus taxi* Inchbald (*Cecidomyia taxi* Inchbald).
Picea excelsa Link.
Homoptera.—*Chermes abietis* Kalt. (*Adelges abietis* Kalt.).
Larix europaea DC.
Homoptera.—*Chermes strobilobius* Kalt. (*Adelges strobilobius* Kalt.).

MONOCOTYLEDONES.

Phleum pratense L.
Fungi.—*Epichloe typhina* Persoon.
Holcus mollis L.
Homoptera.—*Brachycolus stellariae* Hardy.
Agropyron repens Beauv.
Diptera.—*Chlorops taeniopus* Meigen.
Juncus bulbosus L.
Homoptera.—*Livia juncorum* Latr.

DICOTYLEDONES.

Salix fragilis L.
Hymenoptera.—*Pontania proxima* Lepel. (*Nematus gallicola* Ste., *N. valisnierii* Htg.).
Diptera.—*Perrisia marginemtorquens* Winn. (*Dasyneura marginemtorquens* Bremi.).
Salix alba L.
Diptera.—*Perrisia inchbaldiana* Mik. (*Cecidomyia clausiliae* Bre.).
Salix viminalis L.
Hymenoptera.—*Pontania scotaspis* Foerster.
Salix Caprea L.
Hymenoptera.—*Pontania bridgmani* Cam.
Diptera.—*Perrisia marginemtorquens* Winn.; *Oligotrophus capreae* Winn. (*Hormomyia capreae* Wtz.).
Salix cinerea L.
Hymenoptera.—*Pontania proxima* Lepel. (*Nematus gallicola* Ste.).
Populus tremula L.
Diptera.—*Harmandia tremulae* Winn.
Populus nigra L.
Homoptera.—*Pemphigus affinis* Kalt.; *P. spirothecae* Pass.
Betula alba L.
Diptera.—*Massalongia rubra* Kieffer.
Acari.—*Eriophyes rudis* Canest.; *E. rudis* var. *longisetosa* Nalepa.
Fungi.—*Exoascus turgidus* Sadebeck.
Alnus rotundifolia Mill.
Acari.—*Eriophyes laevis* Nalepa.; *E. nalepai* Focken.
Bacteria.—*Pseudomonas radicicola*. This organism seems to be responsible for the formation of the tubercles on the roots of

the Alder (Spratt, *Ann. Bot.* XXVI., p. 119, Jan., 1912). Miss Spratt shows that the supposed *Schinzia, Frankia, Frankiella*, etc., described by previous writers—Woronin, Brunchorst, Maire—are merely mucilage strands in which lie the bacteria. The connection of this organism with nitrogen-fixation is also proved.

Corylus Avellana L.

Acari.—*Eriophyes avellanae* Nalepa (*Phytoptus coryli* Pers.).

Quercus sessiliflora Salisb.

Hymenoptera.—*Andricus pilosus* Adler f. *fecundator* Cam. (*A. fecundatrix* Cam., *Aphilothrix fecundatrix* Hartig); *A. ostreus* Giraud; *Neuroterus baccarum* L. f. *lenticularis* Swanton (*N. lenticularis* Oliv.); *N. tricolor* Hartig (*Spathigaster tricolor* Hartig); *N. tricolor* f. *fumipennis* Swanton (*N. fumipennis* Hartig); *N. vesicator* Schl. (*Spathigaster vesicatrix* Schl.); *N. vesicator* f. *numismatis* Swanton (*N. numismatis* Oliv.); *Dryophanta verrucosa* Schl. (*Spathigaster verrucosus* Schl.); *D. verrucosa* f. *divisa* Swanton (*D. divisa* Hartig); *D. taschenbergi* Schl. f. *folii* Swanton (*D. folii* L., *D. scutellaris* Hartig); *D. disticha* Hartig; *Cynips kollari* Hartig.

Lepidoptera.—*Heliozela stanneella* Fisch. v. R.

Diptera.—*Macrodiplosis dryobia* F. Löw (*Diplosis dryobia* F. Löw); *M. volvens* Kieffer (*Cecidomyia roboris* Hardy).

Fagus sylvatica L.

Diptera.—*Mikiola fagi* Hartig (*Hormomyia fagi* Hartig); *Oligotrophus annulipes* Hartig (*Hormomyia piligera* F. Löw, *H. annulipes* Hartig).

Ulmus glabra Huds.

Diptera.—*Oligotrophus lemeei* Kieffer.

Urtica dioica L.

Diptera.—*Perrisia urticae* Perris (*Dasyneura urticae* Perris).

Homoptera.—*Aphis urticae* Fabr.

Rumex obtusifolius L.

Homoptera.—*Aphis rumicis* L. This gall-former is recorded for Great Britain on *R. crispus* alone, but it seems to be the cause of the curling and slight swelling of the leaf on *R. obtusifolius*.

Atriplex patula L.

Homoptera.—*Aphis atriplicis* L.

Cerastium vulgatum L.

Diptera.—*Perrisia cerastii* Binnie (*Cecidomyia cerastii* Binnie).

Stellaria graminea L.

Homoptera.—*Brachycolus stellariae* Hardy.

Papaver Rhoeas L.

Hymenoptera.—*Aulax papaveris* Perris (*A. rhoeadis* May).

Brassica oleracea L.

Mycetozoa.—*Plasmodiophora brassicae* Wor.

B. Rapa L.

Mycetozoa.—*Plasmodiophora brassicae* Wor.

Capsella Bursa-pastoris Medic.

Homoptera.—*Aphis brassicae* L.

Fungi.—*Albugo candida* Persoon (*Cystopus candidus* Lév.)

Ribes Grossularia L.

Homoptera.—*Rhopalosiphum ribis* Koch.

R. nigrum L.

Homoptera.—*Rhopalosiphum ribis* Koch.

Acari.—*Eriophyes ribis* Nalepa.

Prunus spinosa L.

Diptera.—*Putoniella marsupialis* F. Löw (*Cecidomyia pruni* Kltb.).

Acari.—*Eriophyes padi* Nalepa.

Prunus avium L.
Homoptera.—*Aphis padi* L.

Spiraea Ulmaria L.
Diptera.—*Perrisia ulmariae* Bremi (*Dasyneura ulmariae* Bremi *Cecidomyia ulmariae* Bremi).

Rubus fruticosus L. (*sensu lato*).
Diptera.—*Perrisia picatrix* H. Löw.

Rosa arvensis Hudson.
Hymenoptera.—*Rhodites eglanteriae* Hartig.
Acari.—? *Eriophyes rosae* (Houard, No. 3114).

R. canina L.
Hymenoptera.—*Rhodites eglanteriae* Hartig ; *Rh. rosae* L.

Pyrus Malus L.
Homoptera.—*Aphis pyri* Fonsc. (*A. crataegi* Kalt.).

Crataegus monogyna Jacq.
Diptera.—*Perrisia crataegi* Winn. (*Cecidomyia crataegi* Winn.).

Crataegus oxyacanthoides Thuill.
Diptera.—*Perrisia crataegi* Winn. Both species of *Crataegus* are generally galled by this insect throughout our district.

Vicia sepium L.
Diptera.—*Perrisia viciae* Kieffer.

Buxus sempervirens L.
Homoptera.—*Psylla buxi* L.

Acer Pseudo-platanus L.
Acari.—*Eriophyes macrorrhynchus* Nalepa (*Phytoptus aceris* Nalepa, *P. myriadeum* Murray) ; *Phyllocoptes acericola* Nalepa.

Tilia platyphyllos Scop.
Acari.—*Eriophyes tiliae* Pagenst. Galls similar to those formed by this mite on *T. europaea* L. were found at Barlow in August 1918. There can be but little doubt that they are formed by the same agent.

Hypericum pulchrum L.
Diptera.—*Perrisia hyperici* Bremi.

Viola Riviniana Reichb.
Fungi.—*Puccinia violae* DC. (*Urocystis violae* Sow.), the aecidial stage.

Epilobium montanum L.
Homoptera.—*Aphis epilobii* Kalt.

Heracleum Sphondylium L.
Diptera.—*Macrolabis corrugans* F. Löw (*Cecidomyia corrugans* F. Löw).

Vaccinum Vitis-Idaea L.
Diptera.—*Cecidomyia* sp. (Houard, No. 4571).
Fungi.—*Exobasidium vaccinii* Wor. This fungus is recorded by Swanton for *V. myrtillus* only ; Massee (British Fungus Flora, 1892, Vol. I., p. 108) states that it occurs on other species of *Vaccinium*. We have found it on *V. Vitis-Idaea* at Cathole and on Dore Moor.

Fraxinus excelsior L.
Diptera.—*Perrisia fraxini* Kieffer.
Homoptera.—*Psyllopsis fraxini* L.

Convolvulus arvensis L.
Acari.—*Eriophyes convolvuli* Nalepa.

Nepeta hederacea Trev.
Diptera.—*Oligotrophus bursarius* Bremi (*Cecidomyia bursaria* Bremi).

Linaria vulgaris Mill.
Coleoptera.—*Mecinus noctis* Herbst.

Scrophularia nodosa L.
Coleoptera.—*Mecinus beccabungae* L. (*Gymnetron beccabungae* L.).

Veronica Chamaedrys L.
Diptera.—*Perrisia veronicae* Vallot (*Dasyneura veronicae* Vallot).
V. montana L.
Diptera.—*Perrisia veronicae* Vallot. Swanton (*Brit. Plant Galls*, 1912, p. 65) states that 'On the Continent it attacks *Veronica officinalis* and *V. montana*, causing similar galls [to those on *V. Chamaedrys*], but I am not aware that they have been observed on these plants in Britain'; we found them on *V. montana* at Wingerworth, in September, 1918.
Plantago major L.
Homoptera.—*Aphis myosotidis* Koch.
P. lanceolata L.
Nematoda.—*Tylenchus devastatrix* Kühn.
Galium palustre L.
Diptera.—*Perrisia hygrophila* Mik.
Sambucus nigra L.
Acari.—*Epitrimerus trilobus* Nalepa.
Tussilago Farfara L.
Fungi.—*Puccinia poarum* Nielsen (*Aecidium compositarum* Mart.) var. *tussilaginis* Persoon.
Lapsana communis L.
Homoptera.—*Macrosiphum alliariae* Koch (*Siphinophora alliariae* Koch).
Sonchus arvensis L.
Diptera.—*Cystiphora sonchi* F. Löw (*Cecidomyia sonchi* Connold). Swanton (*loc. cit.*) p. 72, writes:—'*Sonchus arvensis* is of wide distribution in Britain, but its gall is rare, being recorded only from the south of England.' We have found it in very great abundance on this plant at Barlow, Cordwell Valley and Troway in north-east Derbyshire.
Hieracium vulgatum Fr.
A gall apparently resembling exactly that formed by *Cystiphora sonchi* on *Sonchus arvensis* was found on this plant at Cordwell in August, 1918. Unfortunately we were not in a position to breed out the insect.
H. Pilosella L.
Diptera.—*Macrolabis pilosellae* Binnie (*Cecidomyia pilosellae* Binnie).

——: o :——

Mr. F. T. Howard contributes an interesting paper on 'The Geographical Position of Chester' (with maps), to *The Geographical Teacher*, Vol. X., Pt. 3.

The Annual Report of the Yorkshire Philosophical Society, besides the usual details of the Society's work, Meteorological Tables, etc., contains a magnificent memoir on 'Later Mediæval York, the city and county of the City of York, from 1100 to 1603,' with numerous valuable architectural illustrations, by Mr. G. Benson. This makes the report exceptionally valuable.

We are pleased that the *Rochdale Literary and Scientific Society* continues to publish its valuable *Transactions*, Vol. XIII. of which, for 1917-1919, is just to hand. The publication (128+xxxvi pp.) contains numerous good papers, many of which have distinct local interest. Among these we notice 'Natural Transformations in the Vegetation of Blackstone Edge,' by Rev. T. A. Jeffries; 'What Lancashire has done for the Advancement of Electrical Science,' by Dr. J. A. Ashworth, who also contributes a valuable paper on 'Atmospheric Pollution in Rochdale,' a subject recently referred to in these columns. Mr. J. L. Maxim writes on 'Discovery of a Bloomery at Birches, Healey,' and also on Querns recently found in the Distirct.

CUMBERLAND HEMIPTERA-HETEROPTERA.

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

SINCE the publication of the list of above in *The Naturalist*, August, 1916, pp. 252-257, a fair amount of field-work has been done, resulting in the discovery of 29 species and 3 varieties not mentioned therein, and numerous others, thought to be rare or local, have been found to have a more extended distribution.

The object of the present paper is to bring the list up to date. Species marked with a dagger are now recorded for Cumberland for the first time. Those with an asterisk are also new to the original list but have already been recorded, either in *The Naturalist* or *The Entomologist's Monthly Magazine*; they are included here to make this as complete a Supplementary List of Cumberland *Hemiptera-Heteroptera* as possible.

Records without the name of an authority are my own :—

PENTATOMIDAE.

Rhacognathus punctatus L. Cumwhitton Moss, bred from larvae preying on *Halticid* beetles.

Zicrona coerulea L. Cumwhitton Moss, fairly common, also preys on *Haltica*.

COREIDAE.

* *Myrmus miriformis* Fall. Drigg, one specimen (J. Murray, *The Naturalist*, 1918, p. 27).

LYGAEIDAE.

Nysius thymi Wolff. Saddleback, high up.

Cymus glandicolor Hahn. Cumwhitton Moss, Aikshaw Moss, common.

† *Macrodema micropterum* Curt. Cumwhitton Moss, common on bare places among heather; Aikshaw Moss, sparingly.

Trapezonotus arenarius L. Hayton Moss (G. B. Routledge), Carleton, Cumwhitton Moss.

* *Scoloposthetus grandis* Horv. Grinsdale, one specimen (J. Murray, *The Naturalist*, 1918, p. 92).

TINGIDIDAE.

† *Monanthia humuli* F. Thurstonfield Lough, Newton Reigny Moss, on aquatic plants, not scarce.

† *Aradus depressus* F. Tarn Lodge, one specimen (G. B. Routledge).

GERRIDIDAE.

Microvelia pygmaea Duf. Orton, abundant in a pond.

REDUVIDAE.

Coranus subapterus DeG. Cumwhitton Moss, common.

SALDIDAE.

Salda orthochila Fieb. Orton (J. Murray, *The Naturalist*, 1918,

p. 92), Gelt, Tarn Lodge, Castle Carrock (G. B. Routledge), high up on Saddleback, common.

† *S. riparia* Fall. Melmerby Fell (H. Britten).

CIMICIDAE.

Temnostethus pusillus H.S. Kingmoor, under bark.

CAPSIDAE.

Pithanus maerkeli H.S. In its undeveloped form occurs pretty generally in the county.

† *Megaloceraea erratica* L. Blackwell.

Teratocoris saundersi D. and S. Cumwhitton Moss.

* *Lopus gothicus* L. Eskdale (J. Murray, *The Naturalist*, 1918, p. 27).

* *L. gothicus* var. *superciliosus* L. Eskdale (J. Murray, *The Naturalist*, 1918, p. 27).

Phytocoris tiliae F. Durdar, Orton.

* *P. dimidiatus* Kbm. Orton (J. Murray, *The Naturalist*, 1917, p. 88), subsequently found by me in the same locality, Hayton Moss (G. B. Routledge).

P. pini Kbm. Hayton Moss (G. B. Routledge), Crown Woods, abundant on pine and spruce in August.

Calocoris alpestris Mey. Gelt Woods, common on *Stachys sylvatica* in June, Hesket-new-Market.

* *C. ochromelas* Gmel. var. *fornicatus* D. and S. Kirkbampton (J. Murray, *The Naturalist*, 1917, p. 88), Gelt Woods (G. B. Routledge), Orton.

Dichrooscytus rufipennis Fall. Hayton Moss (G. B. Routledge), Crown Woods, Cumwhitton Moss, Orton, common.

* *Lygus rubricatus* Fall. Gt. Salkeld (H. Britten, *E.M.M.*, 1916, p. 278), Crown Woods, common on spruce.

Camptozygum pinastri Fall. Hayton Moss (G. B. Routledge), Crown Woods, common on Scot's pine.

† *Poeciloscytus unifasciatus* F. Orton.

* *P. nigritus* Fall. Carleton (J. Murray, *The Naturalist*, 1918, p. 92), Capsus scutellaris F. Cumwhitton Moss, common.

Bothynotus pilosus Boh. Hayton Moss, July, 1913 (G. B. Routledge).

Orthocephalus saltator Hahn. Seascale (J. Murray, *The Naturalist*, 1918, p. 27).

† *Macrolophus nubilus* H.S. Blackwell, several on *Stachys sylvatica*.

* *Campyloneura virgula* H.S. Wreay (J. Murray, *The Naturalist*, 1916, p. 349), Durdar.

† *Orthotylus tenellus* Fall. Kingmoor, Cumwhitton Moss.

O. viridinervis Kb. Tarn Lodge (G. B. Routledge), Cumwhitton Moss.

O. chloropterus Kb. Port Carlisle.

* *O. concolor* Kb. Gt. Salkeld (H. Britten, *E.M.M.*, 1916, p. 278).

* *O. virens* Fall. Hayton Moss (G. B. Routledge), Spa Well (J. Murray), Cumwhitton Moss, Orton, common on Bay willow.

* *Heterocordylus genistae* Scop. Gt. Salkeld (H. Britten, *E.M.M.*, 1916, p. 278), Seascale, Drigg (J. Murray, *The Naturalist*, 1918, p. 27).

* *Malacocoris chlorizans* Fall. Gt. Salkeld (H. Britten, *E.M.M.*, 1916, p. 278), Wreay (J. Murray, *The Naturalist*, 1916, p. 349), Tarn Lodge (G. B. Routledge), Durdar, Cummersdale.

* *Onychumenus decolor* Fall. Gt. Salkeld (H. Britten, *E.M.M.*, 1916, p. 278), Port Carlisle, Orton, common.

* *Phylus palliceps* Fieb. Orton, one specimen (J. Murray, *The Naturalist* 1916, p. 349), Hayton Moss (G. B. Routledge), Orton, Kingmoor, Castlesteads, common.

P. melanocephalus L. Orton, Kingmoor, common.

Phylus coryli L. Tarn Lodge, not uncommon (G. B. Routledge).
* *Plesiodema pinetellum* Zett. Wan Fell (H. Britten, *E.M.M.*, 1916, p. 279).
* *Psallus lepidus* Fieb. Holm Rook (J. Murray, *The Naturalist*, 1917, p. 88), Tarn Lodge (G. B. Routledge), Kingmoor, Durdar.
* *P. alnicola* D. and S. Dalston (J. Murray, *The Naturalist*, 1917, p. 88).
P. falleni Reut. Tarn Lodge (G. B. Routledge).
P. quercus Kb. Orton, fairly common on young oaks.
* *Atractotomus magnicornis* Fall. Orton, Ivegill (J. Murray, *The Naturalist*, 1918, p. 92), Tarn Lodge (G. B. Routledge), Crown Woods, common on spruce.
† *Plagiognathus wilkinsoni* D. and S. Saddleback, Durdar.
† *Asciodema fieberi* D. and S. Hesket-new-Market, on hazel.
A. obsoletum D. and S. Carlatton, Tarn Lodge (G. B. Routledge), Kingmoor, Durdar, common.

NOTONECTIDAE.

† *Notonecta furcata* F. Wan Fell (H. Britten).
† *N. maculata* F. Edenhall.

CORIXIDAE.

Corixa hieroglyphica Duf. Durdar, Carleton.
C. semistriata Fieb. Stoney Holme, Kingmoor, Thurstonfield.
C. venusta D. and S. Seascale.
C. moesta Fieb. Hayton Moss (G. B. Routledge).
* *C. praeusta* Fieb. var. *wollastoni* D. and S. Sprinkling Tarn (H. Britten, *E.M.M.*, 1916, p. 279), occurs frequently with the type at Orton, Thurstonfield and elsewhere.

——: o :——

Mr. J. F. Musham, the Hon. Secretary of the Selby Scientific Society, has been elected President of the Lincolnshire Naturalists' Union, in recognition of his scientific work in that county.

In connexion with the regrettable accident in the Congo to the scientific men from the Smithsonian Institution, we learn from the press that 'The Smithsonian Expedition had gone in search of a Brontosaurus, which it was rumoured had been seen roving in the dense forest.' A director of an American museum expressed the opinion that the animal, if it existed, was worth millions of pounds. *If* !

Under the heading 'Is a Cockerel an Animal,' the following illuminating legal discussion took place at a recent Petty Sessions, according to the Daily press :—

Is a cockerel a bird or an animal? This nice problem in natural history was put before the Mortlake Petty Sessions, when Mr. T. Kendall was summoned 'for keeping noisy animals, to wit, cockerels.'

Sir James Szlumper (a magistrate) : I have yet to learn that a chicken is an animal.

A police inspector : There is no doubt about it. There have been convictions.

One of the Magistrates, who is a barrister, said the Protection of Animals Act defined a fowl as an animal, and, therefore. it was Common Law.

The Chairman, Sir Charles Rugge-Price (reading from a dictionary), said an animal was described as 'a living corporeal being endowed with living sensations and voluntary motion.'' In my opinion, said the chairman, a cockerel is so endowed (laughter).

NOTES ON ICELAND MARINE MOLLUSCA.

HANS SCHLESCH,
Seydisfjördur, Iceland.

SINCE my list of Iceland Marine Mollusca appeared* Mr. Gudmundur G. Bardarson has published a list compiled from the reports of the Scientific Society of Iceland.† For several years he has collected marine mollusca, especially at Hrutafjördur, in Húnaflói, where he owns a farm, and in addition he has examined the collections in the Copenhagen and Reykjavik Museums. It afforded me great pleasure to read his paper, the first dealing with Mollusca that has appeared in the Icelandic language. As I had overlooked several species recorded for Iceland, and as others are new to the fauna, I have taken the liberty of extracting these additional forms from Mr. Bardarson's paper. The following species noted with an asterisk in my list, as doubtless occurring in Iceland, are recorded by Mr. Bardarsson :—

I. GASTEROPODA.

1. PROSOBRANCHIATA.

Chiton (*Lepidopleurus*) *arcticus* G. O. Sars.
Onchidiopsis groenlandica Bergh.
Ampullina smithi Brown.
Bela nobilis (Möller) var. *scalaris* (Möller).
,, *decussata* (Couthouy).
,, ,, var. *viridula* Möller (=*B. kobelti* Verkrüzen).
Chrysodomus turtoni (Bean).
Homalogyra atomus (Philippi).
Rissoa (*Alvania*) *scrobiculata* Möller.

3. NUDIBRANCHIATA.

Polycera (*Palio*) *Lessoni* d'Orbigny.
Coryphella rufibranchialis Johnston.
,, *lineata* Lovén.
Doris tuberculata Cuvier.
Aldisa zetlandica Alder & Hancock.

II. PTEROPODA.

Limacina retroversa Fleming.

III. SCAPHOPODA.

Dentalium striolatum Stimpson.

V. PELECYPODA.

Lima similis Ad. Jensen.
Nucula tumidula Malm.
Portlandia intermedia (M. Sars).
Arca nodulosa Müller.
Montacuta bidentata Montagu.
Axinus sarsi Philippi.
Neaera arctica M. Sars.
,, *rostrata* Spengler.
,, *jugosa* Wood.

---

* *The Naturalist*, 1918, pp. 342-6 and 385-8. Reprinted in Hull Museum Publications, No. 116.

† Sæ-lindyr vid Island (Mollusca marina Islandiae), Skyrsla um hid Islenska Nátturufrœdisfjelag, Reykjavik, 1919.

Neaera subtorta G. O. Sars.
Trachia papyracea Pennant.
Arcinella plicata Montagu.
Zirphaea crispata Linné.
Psammobia tellinella Lamarck.
,, *ferroense* Chemnitz.

The following species may be marked with * in my list as doubtless living in Iceland :—

GASTEROPODA.

Rissoa (*Cingula*) *globulus* Möller.
,, ,, *pella* Linné.
,, (*Alvania*) *cimicoides* Möller.

SCAPHOPODA.

Dentalium occidentale Stimpson.

Mr. Bardarsson does not include *Mya arenaria* Linné in his paper, though it is recorded from Iceland in Posselt's Grönlands Brachiopoder og Blöddyr, Köbenhavn, 1898, p. 98.

ERRATA.

I should point out that *Chaetoderma nitidulus* Lovén is placed in error under OPISTHOBRANCHIATA instead of PROSOBRANCHIATA, and that *Abra prismatica* Montagu also is found as *Scrobicularia prismatica* Montagu in my list, but during the war it was impossible to send proofs to me in Denmark.

Additions to my list of Marine Mollusca of Iceland :—

I. GASTEROPODA.

1. PROSOBRANCHIATA.

(*a*) *Placophora.*

Chiton (*Lepidopleurus*) *cinereus* Linné.
,, (*Callochiton*) *laevis* Pennant, recorded by Gröndal

(*b*) *Cochleata.*

Scutellina fulva Müller.
Emarginula fissura Linné.
Trochus occidentalis Mighels.
Gibbula cinerea Linné.
[,, *magus* Linné], found on the shore of Reykjavik, certainly imported.
Velutina plicatilis Müller.
Natica (*Lunatia*) *intermedia* Philippi.
,, ,, *tenuistriata* Dautzenberg & Fischer.
Sipho (*Siphonorbis*) *glaber* (Verkrüzen).
,, ,, *fussiformis* Broderip.
,, ,, *propinquus* Alder.
[*Cerithiopsis vulgatum* Bruguiére]. Only recorded from a single specimen from the East Coast, found in the stomach of a lump-sucker fish (*Cyclopterus*).
Capulus hungaricus Linné.
Rissoa (*Cingula*) *islandica* Friele.
[,, ,, *cingillus* Linné.] Recorded by *Linnaeus* from Iceland in *Systema Naturae* as collected by Joh. G. Kœnig ; not found since.

2. OPISTHOBRANCHIATA.

Cylichna cylindracea Pennant.
Philine quadrata (Wood).
,, *finnmarchiana* M. Sars.

THE SPIDERS OF YORKSHIRE.

WM. FALCONER, F.E.S.
Slaithwaite, Huddersfield.

(Continued from The Naturalist for 1919, page 403).

Gen. *Oreontides* Strand.
[Gen. *Tmeticus* Menge ad part.]

O. abnormis Bl. (*Linyphia meadii* Bl.)

Widely distributed in the British Isles as far north as Inverness, and commoner in some parts (especially the north) than in others; abroad, Belgium, France, Switzerland, Germany and Spain; amongst fallen leaves, grass and under stones in woods and on moors. *Adult* summer and autumn, ♀s throughout the year. First record, R.H.M., Low Moor, Bradford, May, 1852 (under stones), sub. *Linyphia meadii* Bl. (S.G.B.I.)

V.C. 61.—Beech Wood at South Cave, 1♂, Houghton Woods, ♂, 2♀s, Riccall Common, 1♀, White Cross (Leven), ♂, Riplingham, ♂, T.S.

V.C. 62.—Cleveland, common on all the moors, J.W.H.; Beast Undercliff, Staintondale, T.S.; S. Cliff, Scarborough, both sexes, R.A.T.

V.C. 63.—Bradford, G.H.O. (V.C.H.); Calverley, S.M.; Ingleton, F.B.; Hurst Wood (Shipley), W.P.W.; Hebden Bridge and Crimsworth Dene, W.P.W., W.F. Not uncommon on the moors, and in the woods and cloughs about Slaithwaite, Dean Head, Marsden, Standedge, Greenfield, Holmfirth, Honley, Meltham, Armitage Bridge, Butternab Wood, Woodsome; Ripponden; Hardcastle Crags.

V.C. 64.—Goredale and Janet's Cave, Y.N.U.; Ingleborough; Bolton Woods; Adel Moor and King Wood; Wharfedale from Harewood to Boston Spa; Sawley High Moor, Mickley and Hackfall.

O. firmus Camb.

Rare, noted for Northumberland, Cheshire, Staffs., Cumberland, and Forres, Scotland; amongst grass and moss and heather. *Adult* ♂ in autumn, ♀s continue into spring. First occurrence—the author, Drop Clough, April, 1903.

V.C. 61.—Houghton Woods near Market Weighton, 1♀, T.S.

V.C. 63.—Drop Clough, upwards of a dozen females at various dates; Royal Clough (Pole Moor), 2♀s; Harden Clough (Meltham), 1♀; Hebden Bridge, 1♀; Deffer Wood (Cawthorn), 1♂.

Gen. *Centromeria* Strand, 2-2.
[Gen. *Tmeticus* Menge ad part.]

C. bicolor Bl.

Widely dispersed in the British Isles, but commoner in the north than in the south; abroad, Sweden, France, Corsica, Germany, Austria and N. Hungary; at the roots of herbage, and amongst moss and fallen leaves. *Adult* ♂ in autumn, ♀ throughout the year. First record—O. P. Cambridge, Bradford, *Zoologist*, 1859, p. 6500.

V.C. 61, 62, 63, 64.—Widely diffused and stations numerous in all parts.

C. concinna Thor.

Very like the last in structure and habits, but smaller; considered by some authorities as merely a variety of it. They have the same distributional range and the same season and are generally found in each other's company. As elsewhere, it reaches to a greater height on the Yorkshire hills than *C. bicolor*, and is more abundant First occurrence—the author, Marsden, Nov., 1898.

Gen. *Centromerus* Dahl., 4-8.
[Gen. *Tmeticus* Menge ad part.]

C. expertus Camb.

Not usually a common spider, noticed in 8 widely separated counties as far north as Fife, and once in Ireland; abroad, Norway, France and Central Europe; in boggy ground. *Adult* throughout the year. First occurrence—the author, Standedge, Oct., 1900.

V.C. 61.—Pulfin Bog (Beverley), 2♀s, E.A.P.; Hornsea Mere, 3♂s, 3♀s, T.S.; Skipwith Common, 2♀s.

V.C. 62.—Eston, Gt. Ayton Moor and Farndale, common, Normanby Intake Plantation, J.W.H.

V.C. 63.—Hurst Wood (Shipley), 1♀, W.P.W.; both sexes, Standedge and Pule, Drop Clough, Wessenden Valley, Clowes Moor, near Marsden; Wholestone Moor; not in any quantity except on Standedge and Pule; Honley Old Wood and Harden Clough.

V.C. 64.—Ingleborough, above Clapdale, 1♂, Brim Bray (Sawley), 1♀.

C. arcanus Camb.

Rare, sometimes locally plentiful; found in mountainous districts, both at high and low elevations; N. of England, Grampians, Glamorgan. France and Hungary; among moss, fern débris, grass, heather, etc. *Adult*, autumn to spring; ♀s throughout the year. First occurrence—the author, Drop Clough, June, 1901.

V.C. 62.—Lonsdale, Farndale, Basedale, Gt. Ayton and Easby Moors, abundant, J.W.H.

V.C. 63.—Drop Clough and Scout Wood (Merridale), in particular abundance; Wessenden Valley; Y.N.U. Meltham, Harden Clough; Marsden Clough and Morton Wood, Holmfirth; Lower Stones Wood (Stocksmoor); Hebden Bridge, Hardcastle Crags.

V.C. 64.—Sawley High Moor, S.M.; Kingsdale Beck, Ingleton.

C. sylvaticus Bl.*

Widely distributed in Britain as far north as Fifeshire, and frequent amongst fallen leaves, moss and grass chiefly in woods; once taken in Ireland (Co. Galway), and abroad, noted for Sweden, France, Central Europe and South Russia. *Adult* autumn to spring. First occurrence—the author, Merridale, Sept., 1900.

V.C. 61.—Bridlington Cliffs, Bielsbeck, Houghton Woods, S. Cave, T.S.; River bank above Selby.

V.C. 62.—Linthorpe, Wilton, Redcar, Normanby, Guisborough, common, J.W.H.; Raincliff Woods, R.A.T.

V.C. 63—Calverley, S.M.; Naylor Rough, Harden and Moorhead (Shipley), W.P.W. Widely diffused in the Huddersfield area, but not numerous; Slaithwaite, Blackmoorfoot, Meltham, Helme, Honley, Holmfirth, Woodsome, Pole Moor, Dean Head, Bury Mill, Marsden, Butternab Wood, Savile Wood, Smith Wood, and Great Lepton Wood, near Huddersfield; Hebden Bridge; Coxley Valley; Deffer Wood, numerous; Askern.

V.C. 64.—Adel Bog, Moor and King Wood, Alwoodley, Roundhay Park (Leeds); Rigton, Wothersome, Bolton Woods.

C. montana Bl. (= *C. prudens* Camb.)

Inhabits the hilly portions of Scotland, Ireland, Wales and the north of England, and in some localities is found on or near the coast; abroad, France only; at the roots of grass, heather, etc., among moss and fallen leaves, often in damp places. *Adult*, autumn to spring; ♀s most months of the year. First record—R.H.M. (S.G.B.I.), Ingleborough, Sept., 1855.

---

* *C. serratus* Camb. recorded as from Huddersfield by Mr. Cambridge, in 'Proc. Dorset F. Club,' Vol. XXVIII., was *C. sylvaticus* Bl.

V.C. 62.—Eston Moor and Redcar on coast, not uncommon, J.W.H.; Raincliff Woods, 1♀, R.A.T.; Ravenscar.

V.C. 63.—Cottingley Wood, W.P.W. Well distributed in the cloughs and on the moors amongst the Pennines, and usually common about Slaithwaite, Marsden, Golcar, Pole Moor, Dean Head, Standedge, Pule, Meltham, Helme, Greenfield, Isle of Sky, Farnley, Honley, Holmfirth, Huddersfield; Wakefield; Hebden Bridge.

V.C. 64—Sawley High Moor; Ingleborough, the commonest spider during an ascent *via* Clapdale, Sept., 1907, and extending to the summit; Roundhay Park (Leeds); Moor Allerton, Adel, Alwoodley.

Gen. *Lessertia* F. P. Smith, 1-1.
[Gen. *Tmeticus* Menge ad part.]

L. dentichelis Sim. (*T. simplex* F.O.P.Cb.)

The first British examples were found on the damp walls of a brewery cellar at Cannock (Staffs.), May, 1891; since taken in a dry filter bed at Brierley Hill, on the coasts of Northumberland at Cresswell, Cumberland at Silloth and of Lancashire at Fairhaven. Rochdale (sewage works), County Durham, Belfast and in Scotland. First occurrence—T. Stainforth, Scalby, Aug., 1909.

V.C. 62.—Scalby Mill, Scarborough, under tidal drift on the shore, 1♂, T.S.; the third British occurrence.

V.C. 63.—Both sexes in quantity at the sewage works at the following places, Wrenthorpe (Wakefield), Castleford and Glasshoughton, J. W. H. Johnstone.

Gen. *Coryphæus* F.O.P. Cb., 1-2.
[Gen. *Gongylidium* Menge ad part.]

C. distinctus Sim. (*Gongylidium distinctum* Sim)

Rare, noted for Carlisle, Hexham, Blackpool, Chester, Oxford and Staffs.; amongst grass and rushes or under stones. *Adult* autumn to spring. First occurrence—E. A. Parsons, Pulfin Bog, July, 1909.

V.C. 61.—Pulfin Bog (Beverley), 1♂, E.A.P.; Barmby-on-the-Marsh, 1♂, 1♀, Sandholme, 2♂s, 3♀s, T.S.; Selby in damp ground near the river, 4♂s, 7♀s, W.P.W., W.F.

V.C. 62.—Middlesbrough, 1♀, J.W.H.

V.C. 63.—Aire bank, between Saltaire and Cottingley Bridge, 2♂s, 3♀s, W.P.W.

Gen. *Diplocentria* Hull., 1-1.
[Gen. *Tmeticus* ad part.]

D. rivalis Camb.

Rare, on record for Staffordshire, Northumberland, Ireland (Kerry), 1♂, and Schiehallion (Grampians); abroad, Switzerland, sub *Centromerus subalpinus* De Lessert, ♂—not ♀; in damp ground. *Adult*, autumn to spring. First occurrence—the author, Standedge, Nov., 1903.

V.C. 63—Standedge, both sexes, from grass surrounding stones in swampy ground; Clowes Moor, Marsden, males; Chew Valley, Greenfield, females? Buckstones, ♂; Scout Wood, Merridale, many adults, both sexes; Slaithwaite moor, both sexes; Cupwith, 1♀; Wholestone Moor, females; Dunford Bridge; Morton Wood, Holmfirth.

V.C. 64.—Morton Moor near Bingley, 1 ♂, W.P.W.; Ingleton, 1♂; Ingleborough, 3♀s above Clapdale; Sawley High Moor, 1♀.

Gen. *Microneta* Menge, 1-1.

M. viaria Bl.

Very widely distributed in the British Isles and on the Continent, North America; generally amongst fallen leaves, moss and herbage

in woods. *Adult* throughout the year. First occurrence—the author, Slaithwaite, Dec., 1898.

V.C. 61.—S. Cave, Melton, Bentley Woods, E.A.P.; Burton Constable and Houghton Woods, T.S.; Riccall Common, W.P.W., W.F.; Scampston.

V.C. 62.—Middlesbrough, Eston, Lonsdale, J.W.H.; Riftswood (Saltburn).

V.C. 63, 64.—Widely diffused and recorded stations numerous.

V.C. 65.—Y.N.U., Upper Teesdale.

(*To be continued*).

——: o :——

Petrology for Students : an Introduction to the Study of Rocks under the Microscope. By **Alfred Harker.** Fifth Edition. revised. Cambridge, 300 pp., price 8s. 6d. We should like to congratulate Dr. Harker on the issue of the fifth edition of his book, the first of which appeared in 1895. The volume has been entirely revised and new figures added.

Aquatic Microscopy for Beginners or Common Objects from the Ponds and Ditches, by **Dr. Alfred C. Stokes.** Fourth Edition. London : Chapman & Hall, 324 pp., 10s. 6d. net. By the aid of two hundred illustrations and clearly written letterpress, Dr. Stokes gives a useful introduction to the study of microscopic pond life. And it is remarkable that while he deals with desmids, diatoms, rhizopods, infusoria, hydra, worms, rotifers, polyzoa, entomostraca and water mites, practically all the specimens described were obtained from a single pond in central New Jersey, U.S.A.

Meteorology for All. By **D. W. Horner.** Wetherby & Co., 184 pp., 6s. net. Mr. Horner, who is a member of the ' British Empire Naturalists' Association, etc.,' whatever that may mean, compiles this book with the object of reaching the man or woman, old or young, who has never previously given a thought to the subject. It has given him great pleasure to compile this book and with the aid of numerous ancient illustrations and several much worn half-tone blocks of varying merit (but rarely good), he gives more or less popular descriptions of the various phenomena coming under the head of Meteorology.

A Handbook to the Vertebrate Fauna of North Wales. By **H. E. Forrest.** London : Witherby & Co., 106 pp., 6s. net. This volume may be taken as a summary of the same author's **Vertebrate Fauna of North Wales,** published in 1907, with additional records. There are now recorded for North Wales twenty-eight prehistoric mammals, eight mammals extinct during the historic period, forty-three existing mammals, two hundred and fifty-seven birds, five reptiles, six amphibians and one hundred and fifty-one fishes. Of each species a brief summary is given showing its status in the area. The book is well bound and should be of service to naturalists interested in distribution.

Animal Life under Water. By **Francis Ward, M.D., F.Z.S.** London : Cassell & Co., 178 pp., 7s. 6d. net. In this work the author describes various natural history objects ' from the fish's point of view,' and by the aid of coloured and photographic illustrations, writes on Cormorant and other divers, Otter and Seal, Heron, Gulls, Kingfishers, ' The Angler and his Lures,' and ' Miscellaneous Observations.' His observations are on lines rarely dealt with in natural history books, and while the ' atmosphere ' of several of the illustrations is frequently foggy, the photographs reproduced certainly well supplement the descriptions of mammals, bird and fish, which the author gives in language easily understood.

DUCK DECOYS.

REV. E. ADRIAN WOODRUFFE-PEACOCK, F.L.S., F.G.S., ETC.

As we were introduced to the mysteries of ' ducking ' in the far away days of the early 'sixties of last century, by the late Tom Tacy, of Ashby Decoy, every book on this subject is a source of pleasure and interest. Mr. J. Whitaker's *British Duck-Decoys of To-day*, 1918 (The Burlington Publishing Co.), is only a little work with 3 pages of preface and 138 of text and illustrations, but it contains a careful summary of facts regarding all the British Decoys at present working, whether for sport and the home table, or for profit at market prices, which during the war have reached record figures. The author, the well-known squire-naturalist of Rainworth Lodge, Notts., is not a F.Z.S. for nothing, and no 'prentice hand at sporting and natural history book-writing.

This little sketch is practically an up-to-date supplement to the late Sir Ralph Payne-Gallweys' larger work on *The History of Duck-Decoys*, and must have a special interest for all true lovers of the *Anatidae*.

The war, and all that the late five years' struggle has implied to this country, has left a mark more or less definite on this work, especially on its illustrations and paper. This is not the fault of its author, and no doubt in these days its publishers are not without legitimate excuse. For Mr. Whitaker has visited most of the important decoys personally, and has used every means of enquiry into all the circumstances of those he has not viewed.

At present only 28 decoys are being worked, and in the home-county of modern decoying and decoys, only the far-famed one at Ashby-by-Scunthorpe, where we learned all our ' duck-lore,' is left, where there were 38 in full activity, taking tens of thousands of birds within the memory of men we have talked with. In his preface Mr. Whitaker says : ' I must admit I am quite at a loss to understand why anyone lucky enough to come into a property having a decoy on it should permit it to lapse. Some owners say, ' Well, it does not pay,' but one would have thought that even if it did not, the giving to one's friends and supplying one's house with birds would have been a recompense for the loss of a few pounds, to say nothing of the delight of seeing scores, many hundreds of ducks on the water during the taking season.' We have seen 5000 at once on the two acres of Ashby Decoy ; and with this we agree for we have had many a noble day's sport and notable bags there. One in 1875 contained 155 birds, taken in a few minutes, with others coming in every hour or so ' to occupy the places of those netted,' for 79 teal, 63 mallards and ducks, 7 widgeon, 4 shovellers, a pintail, and ' a tame-flier,' or barn-yard duck, which had joined its wild relations on its father's side, were counted into the Ashby game room in less than an hour. For when the decoy there was in all its pristine glory, say from 1860 to 1880, male mallards, faithless to their sitting ducks, were an absolutely ' common circumstance ' at farm-yard ponds within an area of five miles from the decoy as a centre. Many times have we watched these birds courting ways at Bottesford Moors, Messingham water-mill and elsewhere. Both Tom and his son, George Tacy, were often ' bothered out of their lives ' by these knowing, ' decoy upsetting ' but ever alert visitors from the outside. In the end, each of these birds had to be shot at night after the true wild duck had departed ; the difficulty was that unless they were specially over-fed they usually flighted with the decoy, and were not within reach when the gun could safely be used.

The book ends with two characteristic chapters on *Interesting Notes about Decoys and Ducks*, and *On Ducks taken now and again*. We have only one complaint to make about this little work—surely it is somewhat of a lost opportunity. Why did not the squire—keen naturalist that he is (for no one could do the work better)—collect and give to the world a

summary of all the facts relating to the fauna and flora of these generally isolated duck-ponds? There are specialists without number who would have been delighted to have helped him over critical questions—it is the material which is so difficult to obtain. Some two score species of British plants are carried by ducks, and by no other known means. The mallard, most likely, or certainly some other species of the *Anatidae*, early in the 19th century, for it was in County Down about 1836, (Hooker's *Student's Flora*), brought the North American Pond Weed (*Elodea canadensis*) from that distant continent to Ireland. In the early forties and fifties ducks spread it wide and far over the British area. This is not an isolated instance, for the Pipewort (*Eriocaulon septangulare*) is undoubtedly another plant which has been duck-carried first to Ireland across the Atlantic ocean, then to the Western Isles of Scotland, and finally, if the record in print is to be relied on, for no specimens are as yet known, to the long-ago drained East Fen, north of Boston—a typically ecological locality for this species. As regards the East Fen supply of ducks, P. Thompson (*Boston*, 1856, p. 676) wrote: 'In these times,' *i.e.*, about 1800, 'a flock of wild ducks has been observed passing along from the N. and N.E. into the East Fen, in a continuous stream for eight hours together.' There were ten decoys alone in its area or immediate neighbourhood. To balance this exchange the Ling-Heather (*Calluna vulgaris*) has been carried by ducks or more probably by gulls from Europe to America, where it is still an isolated stranger.

The fauna of duck-frequented waters is as interesting as their flora. Large trout often frequent decoys 'with runs of water' through the pipes, and pike pool ones too, and sadly 'bother the birds by pulling at their feet as they swim, to such an extent at times that birds forsake their waters.' That ducks disperse the eggs of fish is now beyond dispute, for two modes of egg carriage are well known, and a third has been suggested for which I have some trifling evidence. (1) By the eggs sticking to the flora transported by the birds, on their feet, backs, or as 'necklaces'—all these modes I have personally viewed while watching at Ashby Decoy and other places. (2) By being voided, still fertile, after passing through the alimentary canal of over fed water-fowl—(*Am. Acad.*, V. iv., *Essay* 75)—this I have no experience of. (3) It has been suggested that the minute eggs of fish may sometimes stick to or become entangled in the feathers of wild fowl—(Lyell's *Principles*, Vol. II., page 374). A pond which has been dried out this summer, and at least a dozen other times in the 28 seasons I have studied it, was visited by me on the 28th of May this year, for the purpose of taking off its flora in my usual way. To my utter astonishment I discovered a hen teal and her ten newly hatched out young in possession on this quiet water, roughly a round pond about 90 feet across. Still more astonishing, as I watched her, I saw fish rising to take fly from the water, blown by the N.E. stiff breeze from the surrounding pasture. Once two were in sight together. 'They appeared to have large heads like the Bullhead or Miller's Thumb (*Cottus gobio*) and to be from three to four inches long.' I copy direct from my diary written that day—'The teal and her young astonished me, but these fish even more'! When this pond sank low Herons or Brown head gulls soon took the fish, the foot marks of both species were visible on the dried mud, as is often the case. The problem is not how they were destroyed, but how did they ever get there? Except by Lyell's suggested form of carriage, I cannot think, for there was no new species of plant on or in its waters I had not recorded before; and, more to the point, the species of plants in which eggs are usually carried, *Elodea* or even the still more brittle *Characeae*, were not in evidence, and never have been, my floral analyses prove.

'The rise of the decoys' at evening flight time, which varies with the light is described! A wonderful sight it is, when as many as 5000 birds leave a two acre decoy pond in a few minutes, with a wing sound re-

sembling distant thunder. It is a sight never to be forgotten, for less than ten minutes ' will often clear the water ' when it is not too heavily stocked with fowl. Mr. Whitaker does not attempt to explain the genesis of the instinct which makes ducks leave their own chosen waters, where they rest undisturbed during the daylight hours. Often too for other ducks to take their place during the night ; but never to my knowledge in such over-stocked waters as our small duck-decoys. Though Mr. Whitaker, junior, made a table of the flighting of ducks from the waters in the Rainworth neighbourhood which has proved accurate season after season, his father does not offer any scientific analysis of this curious habit, which theoretically must be of some racial benefit to the fowl. He simply notes the fact of flighting, and after fully describing what he saw one evening at a decoy, leaves this subject for another. Surely the true explanation of the ways of ducks is not difficult to find —' it all belongs to their nature as ducks,' said old Tom Tacy. For these birds, as an order, are curiously gregarious, in the daylight resting in chosen places in numbers, with some of their members always on the alert for trouble. Now this implies a pressure of population on the means of subsistence in contracted water areas—for ducks like sheltered waters free from the ceaseless roll of waves for day-light sleeping. Surely these facts are suggestive ! The force of circumstances has induced a ' natural habit ' in unaccountable generations to such an extent, that a few ducks in a large area of water flight at eventide, as regularly as from over tenanted decoys. If they did not do so they would inevitably lose their wing powers like the domestic duck, or even their nearer relation, ' the tame-flier,' if it remains with its maternal associates and follows their ways. So much is this the case, that in the burning seasons of 1893 and 1911 after heavy thunderstorms, the ducks of the Wash, Humber and inland waters of Lincolnshire were scattered over the pastures ' worming,' as decoy-men call it ; and I could find them in smaller or larger companies, often in pairs, busy at work after storms. At Spalding, in 1895, after a great heat followed by a four hours' tropical thunderstorm, I went out at night to see if I could add to my notes on this matter. I calculated that there were 60,000 worms out per acre on the rich estuarine-alluvium of that area, and I could distinctly hear ' the calls ' of the invisible ducks to one another from all sides as they gobbled up the far-spreading worms to their satisfaction. I have no doubt the Rev. W. W. Mason remembers those worms too, and how two undergraduates were driven indoors by them that evening from their tent in the garden.

Later in the season after harvest, if you know your country, both teal and ducks may be found at night on wheat and barley stubbles, or even on peat-carr, busy feeding on the scattered corn or weed seeds ; and if there is a very heavy dew on worms too. At such times they are stuffed with wheat and barley, as well as the seeds of goose-foot (*Chenopodium album*), many seeded goose-foot (*C. polyspermum*), knot grass (*Polygonum aviculare*) and goose-grass (*Potentilla anserina*), to say nothing of the *Oligochaetae*. In far back days the ' downy ones ' knew how to take them in tunnel nests—decoy fashion—with wings, by the aid of a stalking horse. I have been a parson 38 years, so I know no one who has a practical knowledge of this mode of ' poaching,' or even if there is a man now who follows it, but truly ' this is another tale,' though full of nature and natural history, more fitted for *The Shooting Times* than for *The Naturalist*.

Our author has noted most of these things more or less indirectly, as also the ' iron-rust ' of teal and other aquatic birds, which the late Tom Tacy told me in the early 'seventies was ' quickly picked up by sea-birds ' from the carr-dykes and ditches ' when they first came in.' In his own phrase, for I know nothing about this matter, ' it is the salt as makes the iron-rust stick. Them as the dog got first was scarcely touched wi' red—they'd been too often washed in fresh water, but these birds '—

teal taken by aid of the decoy-ducks—' ha' breasts as rust-coloured as can be ! They know nought o' fresh water. I bet they cumed in,' from the sea implied, ' this morning after feeding last night in a carr-ditch.' He then pointed out an anomaly among the trained ' decoys '—a duck more than 30 years old. It had been born and lived in the decoy pond all its life, and had then grown curly tail feathers like a drake for some seasons, having ceased to lay or to take any interest in nesting matters, though surrounded by descendants ' to the twenty-eighth generation.' To every true sportsman and naturalist this book will not appeal in vain, for it is from nature—the decoys—not from other books and papers.

——: o :——

NEWS FROM THE MAGAZINES.

Mr. H. Rowland Brown has a note on *Erebia aethiops* at Arnside (Westmorland) in *The Entomologist* for December.

Mr. M. A. C. Hinton gives the name *Apodemus fridariensis thuleo* subsp. n. to ' The Field Mouse of Foula,' in *The Scottish Naturalist* for Nov.-Dec., 1919.

No. 2611 of *Nature* may be said to be a ' bread and butter ' number ! Surely never previously have so many testimonials from scientific societies and men been given to a journal. And all well deserved.

In *The Geological Magazine* (No. 663), Mr. J. W. Jackson and others give a ' Revision of Some Fossil Material from Sparth Bottoms, Lancs., and Dr. F. H. Hatch writes on ' Recent Iron-Ore Development in the United Kingdom.'

Among the contents of *The Lancashire and Cheshire Naturalist* for December we notice ' The Flora of Bolton,' Reports on Mammals and Coleoptera of the two counties, a note on ' Some spurious records of Southport Non-Marine Mollusca, and another on Liverpool Botanic Gardens.

A prominent ' pre-historian ' writes to *Nature*, pointing out that certain researches of his are not even alluded to in Dr. A. Smith Woodward's article on ' The Antiquity of Man,' which appeared in the Jubilee number of *Nature* recently. Dr. Smith Woodward replies to the necessarily lengthy article, in four lines, which have done us more good than all the medicine we have had to take during the past week or two.

The Vasculum for July, 1919 (Vol. V., Nos. 1-2), reached us on December 12th, and contains a notice that ' subscriptions for 1918 are now due.' Among the interesting contents we notice ' Haunts of the Black-headed Gull', by W. P. Mail ; ' Durham Place-Names,' by J. E. Hull ; ' British Hydracarina,' by C. D. Soar ; ' Penshaw,' by H. S. Wallace ; ' Botanical Notes,' by J. W. H. Harrison ; ' Physiography and Geology of Penshaw Hill,' by D. Woolacott ; ' Birds' Eggs,' by J. S. F. Walton ; ' Demodex,' by J. E. Hull ; ' Wasp-galls of the British Oak,' by R. S. Bagnall and J. W. H. Harrison, together with shorter notes and records. There are several suitable illustrations.

We learn from *Nature* that the Principal Trustees of the British Museum have appointed Capt. P. R. Lowe assistant in charge of the bird-room at the Natural History Museum in succession to Mr. W. R. Ogilvie-Grant. Capt. Lowe has travelled in various parts of the world, observed birds, and written books, and we learn that during the war he ' served in the R.A.M.C. and was for two and a half years in command of Princess Christian's hospital train.' In such circumstances it seems difficult to understand why the Principal Trustees did not give Capt. Lowe the Directorship of the Natural History Museum ; perhaps they are keeping some such important post for Sir Alfred Mond, who has always taken an interest in our National Museums.

PLANT GALLS FROM WENSLEYDALE.

WM. FALCONER, F.E.S.
Slaithwaite, Huddersfield.

In the course of a tour from Hawes to Masham during Whitweek, the plant galls which occurred on the way were noted, as far as other pursuits would permit, the 55 kinds recorded below coming under notice.

Coleopteron.

Hylastinus obscurus Marsh. On *Trifolium pratense* Linn ; river side between Askrigg and Whorton.

Hymenoptera.

(The first four on willows, the rest on oaks.)

Cryptocampus medullarius Htg. *S. pentandra* : Semmerdale, old and early stage.
C. ater Jur. *S. cinerea* : Semmerdale.
Pontania femoralis Cam. *S. phyllicifolia* : Whorton by the river side. Mr. Wattam also sent me examples from Garsdale.
P. salicis Christ. On long-leaved willows by the river side between Askrigg and Whorton ; Aysgarth falls.
Biorrhiza pallida Oliv. ' Oak apple ' : Jervaulx, old galls.
Andricus curvator Htg. ' Curved leaf gall ' : numerous between Jervaulx and Masham.
A. solitarius Fonsc. Terminal and lateral buds : as the last.
A. quadrilineatus Htg. On male catkins : as the last.
A. nudus Adl. On a dropped male catkin : as the last, but much fewer in number.
Dryophanta verrucosa Schl. On leaves : as the last.
Neuroterus baccarum Linn. ' Berry gall ' on the leaves : Jervaulx and Masham.

Diptera.

Perrisia marginem-torquens Winn. On long-leaved willows by river side between Askrigg and Whorton.
Macrodiplosis dryobia F. Löw. On oak : Jervaulx and Masham.
Perrisia ulmariae Bremi. On meadow sweet : Aysgarth.
P. crataegi Winn. On hawthorn : Wensley.
P. viciae Kief. On *Vicia angustifolia* Roth. : Aysgarth.
P. flosculorum Kief. On *Trifolium pratense* Linn. : Whorton.
P. fraxini Kief. On ash : Coverham, Middleham and Jervaulx.
P. acrophila Winn. On ash : a solitary tree at Hardraw.
Contarinia tiliarum Kief. On lime : Coverham and Middleham.
Perrisia urticae Kief. On nettle : Askrigg, just beginning.
P. ? sp. Large-leaved limes : young terminal leaves on the twigs growing from the base of the trunk, crumpled and irregularly folded longitudinally, the veins contorted and a little thickened—up to six white larvæ between the folds. Semmerdale, Coverham and Middleham churchyards.
P. ? sp. On *Ranunculus acris* Linn. Flowers remaining small and closed, the petals becoming deep orange and then discoloured and slightly thickened ; several dirty-white larvæ amongst the stamens feeding on the pistils, when full fed dropping to the ground, the flower then relaxing. General and abundant.

1920 Jan. 1

Homoptera.

Calipterus quercus Kalt. On oak : Jervaulx.
Phyllaphis fagi Linn. On beech : Hardraw, Aysgarth and Jervaulx.
Rhopalosiphum ribis Linn. On gooseberry and black currant : Askrigg and Wensley.
Aphis padi Linn. On blackthorn : abundant throughout the route. On *Prunus Padus* Linn : Semmerdale.
Aphis crataegi Bcktn. On hawthorn : Whorton and Jervaulx.
Psyllopsis fraxini Linn. On ash : common throughout the route.
Aphis viburni Scop. On *V. Opulus* Linn. : Aysgarth.
Aphis ? sp. On hazel terminal leaves distorted and swollen as on blackthorn adjacent to it : near the saw mill, Askrigg.

Acari.

Eriophyes tetanothrix Nal. On *Salix cinerea* : two localities at Aysgarth
E. salicis Nal. On *S. Caprea* : Aysgarth, Masham.
E. ribis Nal. On gooseberry : Askrigg.
E. brevitarsus Fckn. } On the alder and all plentiful : Hardraw,
E. laevis Nal. } Semmerdale, Cotterdale, Aysgarth, East
E. nalepai Fckn. } Wilton, Jervaulx.
E. rudis Can. var. *longiseta* Nal. On birch : Aysgarth.
E. avellanae Nal. Hazel bud gall : common throughout the route.
E. padi Nal. On blackthorn : plentiful, but much less so than the next—Aysgarth and several localities between Wensley and Coverham. On bird-cherry : Semmerdale and Aysgarth. Red hairy pimples on the upper surface of the leaf with a small aperture below.
E. similis Nal. Abundant on blackthorn : Aysgarth, Wensley, and several localities to Coverham and Middleham. Whitish galls on the lower surafce of the leaf on or near the margin and with a long hairy aperture on the upper surface. These distinctions are necessary as there has been some confusion in nomenclature between the two species.
E. pyri Pagnst. On mountain ash : Aysgarth.
E. goniothorax Nal. On hawthorn : plentiful, Semmerdale, Aysgarth and Jervaulx.
E. fraxini Karp. On ash : between Jervaulx and Masham.
E. macrochelus Nal. On sycamore : Coverham, Jervaulx.
Phyllocoptes acericola Nal. On sycamore : abundant, Semmerdale, Askrigg district, Hawes, Aysgarth, Coverham and Jervaulx.

Anguilluliidæ.

? *Heterodera radicicola* Greeff. On *Poa pratensis* Linn. : irregularly bent swellings of the fibrous roots, by the roadside just east of Middleham. The same gall occurs on the same grass near Huddersfield, and the presence of eelworms in it has been ascertained by microscopical examination.
Tylenchus ? sp. On dandelion, growing intermingled with the last : swellings all up the flowering scapes, such as that illustrated by Ritzema Bos, and copied by Connold in his 'Plant Galls of Great Britain,' fig. 55.

Fungi.

Exoascus pruni Fckl. Hypertrophied fruit of the bird-cherry : Whitfield Force, one tree very badly attacked.
Urocystes violae Sow. On sweet violet, on the leaves, petioles and fruits, in fields near Askrigg.

Undetermined Gall.

On the leaves of dog's mercury, a portion near the tip elevated into a convex blister with a corresponding cavity below, midrib with a roughened appearance, due to the presence of what appear to be the eggs of a mite in the second or deutovum stage of their development, in which the hard brown outer covering splits open longitudinally and discloses the thin pale membrane beneath, in order to allow of the free growth of the larvæ, which will hatch out from the contents of each case : Mill Gill Force.

On one of the leaves brought home, a microscopic mite, eight-legged, dull yellow-brown in colour, with two very large round red spots—one on each of the median line—hence easily recognisable ; very active in its movements and difficult to keep within the field of the microscope—was noticed wandering over the midrib and in the blister. It may not, however, have had anything to do with the abnormal growth, as there were other mite galls in the box, and since I have seen similar but immaculate mites amongst the swollen twisted hairs of the galls, both of *Eriophyes brevitarsus* Fckn (alder) and *Phyllocoptes acericola* Nal. (sycamore) in company with the elongated four-legged true agents.

———o———

Early emergence of Phigalia pedaria.—On December 4th, 1919, I found *P. pedaria* ♂ in Wheatley Wood. This is the earliest date on which I have seen it.—H. H. Corbett, 12/12/19.

———o———

The Rev. E. S. Marshall, the well-known botanist, died on November 25th. His herbarium has been bequeathed to the University of Cambridge.

Mr. G. R. Carline writes on ' The Arrangement of Local and Folklore Specimens as a Nucleus of an Open-air or Folk Museum,' in *The Museums Journal* for December.

Mr. G. Maynard has been appointed Curator of the Ipswich Natural History Museum, Mr. F. Woolnough remaining in charge of the Art Gallery and Christchurch Mansion Museum of Archæology.

The collection of precious stones formed by the late Sir Arthur H. Church, and prsented by his widow to the British Museum, has recently been exhibited in a special case in the Mineral Gallery. There are over 200 specimens.

According to the local press, there was landed at Billingsgate, Hull, on the 15th of December, a ' Star Fish ' weighing three cwt. This seemed to be the sort of thing that should be preserved in the local Museum, but on enquiry the specimen proved to be a Sun Fish.

We learn from the press that a suggestion is under consideration by the Leeds Philosophical and Literary Society for the disposal of the Philosophical Hall, together with the valuable contents of the Museum, to the Leeds Corporation. What has been done up to the present time is merely to enter into conversations with the Town Clerk, and during these consideration was given to the question of alternative accommodation for the society, in order that its work may go forward. The site in Park Row upon which the society's premises were built 100 years ago was valued a few years since at £50,000. The building when first erected cost £7,000, and in 1862 extensions were made which entailed an expenditure of £11,000. The Museum collection is, of course, of great value to Leeds, because of the relationship which many of the exhibits have with the locality.

In Memoriam.

LORD WALSINGHAM.

By the death of Lord Walsingham, which took place from pneumonia on December 3rd, at the age of 75, the Yorkshire Naturalists' Union has unhappily lost another of its ex-presidents. Born on July 23rd, 1843, he was educated at Eton and Trinity College, Cambridge. As the Hon. Thomas De Grey he sat in Parliament for the Western Division of Norfolk from 1865 until 1870, when he succeeded to the title of Lord Walsingham on the death of his father. In that and the following year he travelled extensively in California and Oregon, dividing his time between sport and entomology, and during eighteen months of the expedition he never slept in a bed. On his return home he published a paper in the *Proceedings of the Zoological Society* on the distribution of deer and other ruminants in Northern California and Oregon. But his entomological results were more important and formed the nucleus of what became the greatest collection of the microlepidoptera that had ever been made, and which became the subject of his chief contributions to Entomological Science. He named and described a vast number of new species, and his monographs on many of the groups of micro-lepidoptera from many parts of the world, in the *Entomologist's Monthly Magazine*. *The Transactions of the Entomological Society of London*, etc., will always be a standing monument of his enthusiasm and herculean work in this department of science. Probably indeed, no one had so intimate a knowledge of the microlepidoptera of the world as he had.

But his fine collection of macrolepidoptera showed that he did not neglect the larger moths, and he was one of the first to grasp the desirability of shewing the earlier stages along with the perfect insects, and so made perhaps the largest collection of preserved larvæ of the various species that has ever been got together. His method of mounting the larvæ on artificial leaves or stems of the natural food-plants, too, greatly enhanced their interest and usefulness, as a number of those which were done by him in the writer's own cabinet abundantly testify. In 1901 he made over his collections to the British Museum, and the Museum also owes to his generosity a large number of cases containing groups of birds, with their nests, eggs, and young, mounted in natural surroundings.

Lord Walsingham's connexion with Yorkshire was through his estate at Blubberhouses, at which, in September, 1885, he hospitably entertained the members of the Yorkshire Naturalists' Union, and the great enjoyment of which will long be re-

membered by those who were present. Almost equally enjoyable, too, was the excursion to Bishop's Wood during his presidency of the Union in 1884, when he added *Laverna phragmitella* to the Yorkshire list of Lepidoptera, by 'spotting' the affected *Typha* stems in the water from his seat in the railway carriage on his arrival at Sherburn station to attend the excursion. He enjoyed that meeting immensely, and in a letter to the writer several days later (now before me) he wrote: 'I was really much flattered and extremely pleased in every way by the cordial reception which I met with at the hands of all the members and associates of the Yorkshire Naturalists' Union present on Monday.' He also took a keen interest in the publication of the 'List of Yorkshire Lepidoptera,' and sent his collector, Thomas Eedle, to spend a season at Blubberhouses to work the lepidoptera, in order to add a new locality, or new species to the county. The specimens collected by Eedle were afterwards largely distributed among the lepidopterist members of the Yorkshire Naturalists' Union. It should be added also that in his entomological work Lord Walsingham was ably assisted by his sister, the Hon. Beatrice de Grey (now the Hon. Mrs. Carpenter), and who, some years ago, presented her own collection of lepidoptera, with the cabinet, to the Technical College Museum, Huddersfield.

Lord Walsingham's presidential address to the members of the Yorkshire Naturalists' Union, at the Mansion House, Doncaster, entitled 'Some probable causes of a tendency to Melanic variation in Lepidoptera in high latitudes,' created considerable discussion among lepidopterists, and in the London Entomological journals at the time, with the result we believe, that being convinced there was as much to be said against as in support of his theory, he largely abandoned it.

From 1893 to 1912 he was on the Editorial staff of the *Entomologist's Monthly Magazine*, to which journal he was a large contributor. As a sportsman he was at one time considered the best shot in the country, and his bag of 1070 grouse to his own gun is probably a record. He was, too, probably, the only entomologist who collected lepidoptera by means of his gun. The larvæ of *Pyralis glaucinalis* often feeds in numbers in the large dense bunches of twigs caused by *Phytopus* which occur so often high up on birch trees, and Lord Walsingham used to get them by sending a bullet through the branch below the bunch of twigs, and so dropping them to the ground. A good part of my own series of *P. glaucinalis* I bred from a bunch of the twigs sent to me by him, which he wrote he had shot off in this way.

Lord Walsingham was the eldest surviving trustee of the British Museum, and was also a trustee of the Hunterian Museum of the Royal College of Surgeons; was High Steward

of the University of Cambridge ; a Fellow of the Royal, Linnean, Entomological, and Zoological Societies ; and member of many foreign Entomological Societies ; he also held the degree of LL.D., and was a J.P. He was president of the Entomological Society of London for the two years 1889-90, and was for some time on the Council of the Linnean Society. In his youth he was a well-known cricketer, and played in the Eton and Cambridge Elevens at Lords : he also shot twice in the Lords versus Commons matches at Wimbledon.

As a man he was tall, with a handsome and commanding appearance, and was courteous and amiable to his wide circle of personal friends of every grade of social standing. He was always ready to assist, often at considerable trouble on his part, entomologists or anyone interested in his pursuits, as the writer well knows from experience. His work and influence as Trustee of the British Museum were always directed towards the extension and proper display of the collections. His death makes a second vacancy among the trustees, as no successor has yet been appointed in place of the late Mr. du Cane Godman, another foremost entomologist, and it is to be hoped that the new appointments will include at least one entomologist of equally high standing.

Lord Walsingham's funeral took place at Merton, near Thelford, Norfolk, on December 6th.

G. T. P.

——: o :——

CHARLES THOMAS WHITMELL, M.A., B.Sc., F.R.A.S.

The death is announced of C. T. Whitmell, at one time H.M. Chief Inspector of Schools for the Leeds District, in his seventieth year. For many years he has been intimately associated with the various scientific societies in Leeds—having been the President of the Philosophical and Literary Society. He was generally to be found taking active part in the discussions of the Leeds Geological and Astronomical Societies, and for several years edited and largely contributed to the Journal of the latter Society. He was a frequent contributor to the technical journals and the daily papers on mathematical and astronomical matters—these two being his favourite subjects—in fact he is said to have been one of the best amateur astronomers in the country. He was of a very genial nature and the enormous number of representatives of various scientific societies present at his funeral was some indication of the high esteem in which he was held. Mrs. Whitmell died two or three years ago, and there is no family.

—: o :—

Sir E. Ray Lankester has completed half a century's editorship of the *Quarterly Journal of Microscopical Science*.

CORRESPONDENCE.

ROYAL METEOROLOGICAL SOCIETY PHENOLOGICAL RETURNS.

With 1920 these returns complete the thirty years which is a recognised critical epoch in meteorological records. In consequence of the war our observing stations have fallen to 110 last year, against the high-water mark of 132 in 1914. We are most anxious now to recover lost ground, and would in this respect like to make 1920 preparatory to the years to follow. A reasonable total would include at least 220 stations, an average of 20 only for the 11 Meteorological Office districts. At present we are short of this in all but England S.E. and the Midlands. The six districts forming Scotland, Ireland, and England N.E. average only $3\frac{1}{2}$ each. Wales has two stations only, both in the S.W. The observations asked for refer to the blooming of 13 common flowers, and the appearance of 6 birds and 6 insects. Other migrant records and notes are also invited, but these are of secondary importance. A copy of the observing form and of a recent report will be sent with pleasure (the reports so far as available) to any of your readers who would be interested to help. We especially suggest the value for all interested in nature study or regional survey classes. Inquiries should be addressed to one of us, or to the Assistant Secretary, Royal Meteorological Society, 70 Victoria Street, S. W. 1.

Yours, etc.,

J. Edmund Clark, "Asgarth," Purley, Surrey.
H. B. Adames, 33 Holcombe Road, Ilford, Essex.

December 11th, 1919.

——: o :——

Mr. C. P. Chatwin has resigned the post of Librarian to the Geological Society of London, in order to take up an appointment at the University of Liverpool, and Mr. A. Grieg reigns in his stead.

At a recent meeting of the Lancashire and Cheshire Entomological Society a specimen of *Nonagria geminipuncta* was exhibited. It had been captured at Delamere by Prof. Newstead, and was new to the local list.

The Annual Meeting of the Lancashire and Cheshire Entomological Society was held on December 15th, Mr. R. Wilding, President, in the chair. The following were elected for the ensuing year: President, Mr. S. P. Doudney; Vice-Presidents, Messrs. R. Tait, R. Wilding and Dr. G. B. Longstaff; Hon. Treasurer, Dr. John Cotton; Hon. Librarian, Mr. A. W. Hughes; Hon. Secretary, Mr. William Mansbridge. Mr. F. N. Pierce, of the Old Rectory, Warmington, Oundle, Northants, was elected as Honorary Member of the Society. The President read an address entitled 'Notes from Cartmel Fell.'

From the two adjoining advertisements in a recent issue of *Nature* it would almost seem that curators, in addition to knowing something of everything, must be 'gentlemen with private means'—

> Gloucester Museum.—The Committee wish to meet a gentleman with some private means, and with experience in antiquities and natural history, who would be willing to act as Curator and Secretary, and to interest himself in the development of the museum from the educational point of view. Apply, stating age, qualifications and salary required, to the Secretary, Public Museum, Gloucester.
>
> The Trustees of a Museum in an interesting country town desire to meet a gentlemen with some private means and experience in Natural History and Antiquities, who would be prepared to act as Curator and Secretary, and to take an interest in the educational development of the collections.—Apply, stating salary required, to 'Museum,' Box 27, Office of this paper.

YORKSHIRE NATURALISTS AT DONCASTER.

THE Fifty-eighth Annual Meeting of the Yorkshire Naturalists' Union was held at Doncaster on Saturday, December 6th, 1919. There was quite a representative gathering of members and associates from all parts of the county, delegates from twenty-four of the affiliated Societies being present. At the meetings held in the Mansion House, kindly lent by the Doncaster Corporation, the President, Dr. W. G. Smith, B.Sc., occupied the chair. At the meeting of the General Committee held in the afternoon, the Executive's Report on the Year's Work of the Union was presented and adopted, officers were elected, and the excursion programme for 1920 was arranged. The financial position of the Union was candidly dealt with by the Honorary Treasurer, Mr. Edwin Hawkesworth. He explained that the deficit on the year's working was due entirely to the increased cost of printing and postages, and hoped that the members would respond to the appeal for an increased membership. He moved the proposition ' That the members of the Union should in future pay an annual subscription of not less than 12/6, and that the qualification for life membership should be a donation of not less than £9.' This was seconded by Mr. H. B. Booth, and carried unanimously. The announcement by the Chairman that the President for 1920 would be Prof. J. E. Marr, Sc.D., F.R.S., Cambridge, was well received. Having regard to his work in connexion with Yorkshire Botany, especially the publication of the Flora of the West Riding of the County, Dr. F. Arnold Lees, M.R.C.S., Leeds, was unanimously elected an honorary member of the Union. Mr. Thomas Sheppard, M.Sc., was elected to represent the Union at the meeting of the British Association. The Bradford delegates extended an invitation to the Union to hold its Annual Meeting for 1920 at Bradford, and this was cordially accepted. The evening meeting was very well attended. Twenty-five new members were elected. Dr. Smith delivered his presidential address entitled ' The Naturalist and the Gardener,' from the chair. In his introductory remarks he stated that in addition to the production of food, many gardeners who were naturalists had used their gardens for the further advance of their studies of plants and insects, and the allotment movement throughout the country had greatly increased the tillers of the soil, and thus added to the number of students of plant and insect life. He also referred to his good fortune in having resided eleven years in Yorkshire, during which time he had enjoyed immensely, as well as appreciated, the enthusiastic manner in which Yorkshire naturalists followed the pursuit of their studies in the field. He subsequently, with the aid of a considerable number of lantern views, enphasised the advantages which had been derived from the scientific study of the wild cabbage and wild beet, and also analysed the manner in which wheat and barley were hybridised. Dr. Smith also remarked that he considered the time had now come when a distinct check ought to be put upon those persons who were constantly adding new ' species ' to our list of plants, which ' species,' upon examination and test, proved to be mere casual variations. He deprecated the haphazard manner in which this ' species ' making was done, without any experimental testing, and by way of illustration to show how plants readily responded to changes under growing conditions, exhibited a slide of *Gentiana Amarella* growing under ordinary conditions, in alpine gravel, and sub-alpine gravel. Cordial thanks were accorded to Dr. Smith for his address, and for his services during the year, on the motion of Prof. J. H. Priestley, seconded by Prof. P. F. Kendall. Dr. Smith, in response, thanked the members for their tribute, and warmth of their appreciation. Hearty thanks were also given to the Doncaster Scientific Society for undertaking the local arrangements, and to the Doncaster Corporation for use of the room at the Mansion House, the reply of Dr. Corbett concluding another very successful gathering of the Union.—W.E.L.W.

A YEAR'S SCIENTIFIC WORK:

being

THE YORKSHIRE NATURALISTS' UNION'S FIFTY-EIGHTH ANNUAL REPORT

FOR 1919.

(Presented at Doncaster, 6th December, 1919).

——: o :——

The Fifty-Seventh Annual Meeting was held at Leeds on Saturday, 7th December, 1918. A full report of this meeting appeared in *The Naturalist* for January, 1919, and our journal also contained the Presidential Address of Prof. W. Garstang, M.A., D.Sc., F.Z.S., on 'Nature and Man'; pp. 89-96; 123-134.

Six Field Meetings have been held, viz. :—at Coxwold, Ryhill near Wakefield, Hawes, Pateley Bridge, Spurn, and Helmsley (Mycological meeting). In addition the Marine Biology Committee held its Annual meeting at Scarborough from the 26th to the 29th September. The attendance at most of these gatherings was satisfactory. The usual programmes were issued, and full reports of the excursions have appeared in *The Naturalist*.

The Excursions for 1920 will be as follows :—

Yorks., Mid. W. Skipton (Easter week-end), April 3rd to 5th.
,, N.W. Richmond (Whit week-end), May 22nd to 24th.
,, S.W. Martin Beck, near Doncaster, Saturday, June 19th.
,, N.E. Kirkham Abbey, near York, Saturday, July 10th.
,, S.E. Beverley (August Bank Holiday week-end), July 31st to August 2nd.
Mycological Meeting at Helmsley in September.
Annual Meeting at Bradford, 4th December.

Membership.—After making the inevitable deductions the number of members on the register is 362. An effort was made in the early part of the year to increase the membership with the result that thirty-eight new members have been elected as follows :—

Mr. R. S. Adamson, M.A., B.Sc., The University, Manchester.
Mr. J. H. Brook, The Old Vicarage, Selby.
Mr. John J. Brigg, M.A., J.P., Kildwick Hall, Keighley.
Miss Winfred M. Bates, 35 Armitage Road, Birkby, Huddersfield.
Mrs. Alice S. Bacon, B.Sc., Technical College, Huddersfield.
Miss Esther C. Bentley, B.Sc., 3 Hardy Grove, Beeston Hill, Leeds.
Mr. Walter G. Birch, 20 Barbican Road, York.
Mr. William Carr, Strammongate School, Kendal.
Mr. Edward Cockshaw, 65 Blacker Road, Birkby, Huddersfield.
Mr. E. W. Maule-Cole, Hillside, Northiam, Sussex.
Mr. Charles H. Fletcher, Apsley House, Albion Road, Scarborough.
Mr. Linnæus Greening, F.L.S., F.Z.S., M.B.O.U., "Fairlight." Grappenhall, Cheshire.
Mr. J. R. Howard, 81 Chester Road, Shotton, Chester.
Mr. Ralph Hellings, Prospect View, Farnhill, Keighley.
Mr. Henry Heaton, Cot Field, Roundhay, Leeds.
Mr. Ernest Hallowell, 92 Edward Street, Sowerby Bridge.
Miss D. Hilary, B.Sc., 15 Plevna Terrace, Bingley.
Mr. Richard Jones, 24 Rutland Park, Sheffield.
Mr. F. H. Lawson, Thurstonville, Brighouse.

Mr. Maurice Longbottom, 33 South View Terrace, Silsden ,Keighley.
Mr. J. H. Lumb, 32 Undercliffe Terrace, Scarbottom, Halifax.
Mr. Percy Mosley, 5 Skipton Road, Steeton, Keighley.
Mr. Albert J. Moore, Ousefield Poultry Farm, Riccall.
Mr. Charles H. Moss, Woodside, Rotherham.
Mr. W. Marsden, A.M.I.M.E., 7 Heathfield Place, Halifax.
Mr. Thomas Norton, O.B.E., D.L., J.P., Bagden Hall, Denby Dale, near Huddersfield.
The Rev. F. Adrian Woodruffe-Peacock, Cadney Vicarage, Brigg.
Mr. Fred Pullan, 9 Oban Place, Armley, Leeds.
Mr. Robert G. Riddell, M.D., F.R.C.S.E., Chilton Lodge, Rotherham.
Mr. Frederick Reed, Parkside, Hartburn Lane, Stockton-on-Tees.
Miss Annie Riley, Elizabeth Steet, Elland.
Mr. H. L. Stephenson, 90 Tempest Road, Beeston Hill, Leeds.
Mr. J. Steedman, Catterick.
Mr. T. J. Spencer, F.R.G.S., 8 Heath Hall, Halifax.
The Warrington Field Club, c/o Mr. J. Smith, M.R.I.A., 62 Willis Street, Warrington.
Mr. F. D. Welch, M.D., Hartley, Longfield, Kent.
Mr. C. H. Wells, M.B.O.U., 80 Brookhouse Hill, Fulwood, Sheffield.
Mr. Frank Wood, School House, West Vale, Halifax.

The Affiliated Societies number 34. Their total membership, calculated from the furnished returns, is 2324. The numerical strength of the Union is therefore 2686.

Bird Protection.—Efforts have been made by the Union, through their Wild Birds and Eggs Protection Committee, to obtain complete protection throughout the year for the Green Plover and its eggs for the whole of the County. The North and East Riding County Councils have not granted the Union's request, but it is gratifying to record that the West Riding County Council has decided that henceforth in its area the Green Plover and its eggs are to receive protection throughout the year. The Union desire to place on record their appreciation of the services rendered by Mr. W. Bagshaw, J.P., in this matter.

Obituary.—The Union regret the loss of Richard Barnes (Harrogate), an active worker in the Bryological Section; Thomas Gibbs (Lindfield) and Anthony Wallis, M.A., (Penrith), both active workers in the Mycological Section; S. L. Petty, the well-known Lancashire botanist; and W. Denison Roebuck, M.Sc., F.L.S., one of the pioneers and organisers of the Union, whose activities on its behalf covered a period of thirty years, during which time he held office as Honorary Secretary, Editor of its publications, and President. In Memoriam notices of these gentlemen have appeared in *The Naturalist.*

The Divisional Secretaries have again materially assisted in making the local arrangements for the Excursions.

General Committee.—The following have been elected members of the General Permanent Committee of the Union, viz.:—Mr. T. Cockerline, Leeds; Mr, F. A. Mason, Leeds; Mr. H. N. Murphy, B.Sc., Leeds; Mr. C. F. Procter, Hull; Mr. F. Pullan, Leeds; Miss E. E. Rushworth, Halifax; Mr. W. Taylor, York.

VERTEBRATE ZOOLOGY SECTION.

West Riding.—Mr. H. B. Booth writes:—As evidence of the cold and very late season (the Cuckoo is usually heard at Ben Rhydding on April 25th or 26th), this year it was not detected until May 3rd—only

the second time during eleven years that I have not heard it in April. For several years Ravens have been reported from near Malham towards the end of their breeding season, and although there is still no actual proof of their nesting there, yet Mr. A. Haigh Lumby picked up a young Raven, recently dead, and apparently only just fully fledged, in Gordale Scar, on Whit Tuesday (June 10th). The Eshton Herons have all nested again across at Lords Wood, but as tree-felling has now ceased on the Eshton estate it is possible that they may again return to their quarters in the Great Wood there. The pair that nested last year at Bolton Woods did not return this year: probably the nest and its contents were too much photographed. Nesting Goldcrests do not increase, and nesting Yellow-hammers still continue to decrease. The Tree Creeper, which used to be so common in Wharfedale, has, for some unknown reason, become rare during the last two years. In the same dale the Woodcock is increasing as a nesting species. Mr. T. Roose reports five nests known in the neighbourhood of Bolton Woods, and I have reports of others from various parts of the dale. Two, if not three, pairs of Peregrine Falcons nested on the fells of the N.W. and over a certain fell there Mr. E. R. Wethey reports that a few pairs of Dunlin still nest. (This fell was the last nesting place of the Dotterel in Yorkshire). A supposed Garganey's nest at Austwick Moss turned out to be that of the Teal; fortunately I was able to forward an egg, together with some down and feathers, to Mr. P. F. Bunyard, of Croydon, who has made a special study of wild ducks' eggs, etc. After an interval of three years the Grasshopper Warbler reappeared at Bingley.

It has been one of the worst years on record for the Red Grouse. Apart from the great moorland fire that for a week at Whitsuntide raged over vast areas in the neighbourhood of Pateley Bridge, Masham and Coverdale, it was altogether a very bad breeding season. In all the 'bags' of which I have obtained details, the old birds greatly outnumbered the young ones. Some gamekeepers attribute this to the short, but very severe, snowstorm on April 27th; but others, and possibly with more accuracy, put it down to the retarded growth of heather and other vegetation upon which the young grouse feed. A Red Grouse 'almost exactly like a Ptarmigan, excepting that it had a red breast' was reported in *The Field* as having been shot on Cam Moor, in Upper Wharfedale.

Mr. S. Longbottom reports that a flock of eighty to a hundred Wild Geese passed over Manningham Mills (Bradford) on December 21st, 1918, about 3 p.m.

East Riding.—Mr. E. W. Wade reports:—A wet autumn and winter unaccompanied by any severe frosts, was followed by severer cold in the early spring. A heavy fall of snow on 27th April, accompanied by sharp frost, caught some of the earlier birds at the nest and drove them from the eggs. Peewits suffered heavily. They were late in nesting, and in many cases deserted well incubated eggs. Robins and Thrushes also suffered. The Corvidæ, as usual after a wet winter, found food abundant, and were well up to date in nesting and laying full clutches. The Magpie has bred in mid-Holderness again, whence it had been banished by the gamekeeper for many years. The Long-eared Owl started laying at the end of March, and full clutches were found in the third week in April. The Tawny Owl did not breed at all, so far as could be ascertained. Five pair were observed sitting out in the woods all the spring, but for what reason it is impossible to say. There seems to be some problem in the reproductive economy of the Owls, which remains to be solved. Of the White Owl, two clutches of eggs, six and five, were observed, but were apparently taken, for no young were reared. Migrants arrived very nearly on the same date as in 1918, except the

Cuckoo and Swift, which were on the average a week earlier. The Cuckoo was more numerous than for some years and the laying season a prolonged one. On the 4th June a young one was on the wing, and in the same parish fresh eggs were seen. The Swift was late in departing, odd birds being seen up to 8th October. The Greenfinch and Grey Linnet were again very numerous, the laying date of the latter extending from early May to the first week in August. The Goldfinch continues to increase. The Goldcrest is returning, a flock being seen last winter and a pair of breeding birds in May. The season has been a good one for all small birds, who have reared their young without loss from heavy rain or excessive cold. Warblers and Flycatchers have been abundant, but Swallows and Martins scarce. The feature of the year has been the great increase in numbers of Hawks and Carrion Crows. Turtle Doves continue to increase; a flock of forty was seen on the Wolds in late summer. Partridges in some districts have suffered severely from gapes, and are patchy even in the best districts. A plea must be put in for further protection of the Peewit, which in the Wolds is decreasing as a breeding bird, and in some districts is not half so numerous as formerly, whilst on the Carrs it is much scarcer than four years ago. The Corncrake has been recorded in seven localities, but has been comparatively silent. On February 22nd, a Bittern was flushed from the reeds of Hornsea Mere. On May 8th to 11th, a Marsh Harrier frequented the Mere; from the description it was a male bird. On March 27th to April 3rd, many dead Guillemots were washed ashore at Hornsea, among them an immature Black-Throated Diver. On 26th April, two Jack Snipe were seen in Burton Constable Park. On 12th July a Buzzard flew over the Burton Constable Woods. The Pink-footed Geese made their appearance on 23rd September.

North Riding.—Mr. W. J. Clarke writes :—During 1919 the local increase in the number of Tawny Owls has continued, in one instance it nested and reared its young within the Borough boundaries of Scarboro'. It is probable that another pair nested in the Ramsdale Valley, as the birds could be seen and heard there during most of the year. Green Woodpeckers have been more numerous, while Landrails have maintained the increase recorded last year. Whinchats also have been more noticeable, and in the Whitby district their numbers have increased considerably. Stonechats have been scarcer, and were quite absent from well-known nesting haunts. Kingfishers hold their numbers and some increase is reported in the Whitby district. Dippers also are becoming more numerous on our streams. The Red-backed Shrike has been noticed, and its larder discovered, near Newholme, an unusual occurrence in the North Riding. On September 3rd, a Swift was watched, for some time as if feeding young. The bird stayed about until September 13th, but no young were observed to leave the nest. The Sand Martin, House Martin, and Swallow were still here on September 29th. On April 21st a Red-legged Partridge was picked up in an exhausted condition in a Scarborough street. The Shags, which of late years have been regular winter visitors to the coast, did not arrive in their usual numbers during the winter of 1918-19. All the common species of Gulls are increasing enormously. The Recorder is indebted to Mr. F. Snowdon for notes which have been of assistance in compiling this report.

York District.—Mr. W. Hewett writes :—Landrail, heard on May 9th at Stamford Bridge. Black-headed Gulls were more numerous on Skipwith Common than has been the case for the past five years. Shoveller : Several pairs have nested and succeeded in rearing their young, and three pairs of Pochard are known to have nested on the Common and reared their young. Only three or four pairs of Redshank were noticed there this summer. A young Cuckoo, between fourteen and twenty-one days old, found in the nest of a Hedge-sparrow, was brought to me alive.

I fed it on raw meat, worms, caterpillars of various species, and bread. It thrived rapidly and became quite tame. I liberated this bird on August 4th, in a wood not far from where it was hatched. Swift : first noticed at York on the 7th May. I have also seen this bird at Wilberfoss (August 17th), Beningborough (September 14th), Easingwold, Tollerton, and Coxwold (August 31st), and my last record for it is 21st September, at Bishop-Wilton. A Wryneck, in beautiful plumage, was obtained at Flamborough on the 9th September.

WILD BIRDS AND EGGS PROTECTION COMMITTEE.

Mr. Johnson Wilkinson writes :—

North Riding.—Young Falcons have hatched and flown.

Green Plovers.—Now protected all the year round in the West Riding.

Spurn.—We were fortunately able to secure the services of our old watcher ; reports on the whole are satisfactory. Ringed Plovers were numerous ; Lesser Terns about half the usual quantity. No destruction of nests this season.

Bempton.—Falcons only produced one egg, which did not hatch. Climbers have had a good season. Three Fulmars were seen about the Cliffs but did not settle.

Hornsea Mere.—There have been about the same number of the Great Crested Grebe as usual, and young birds well hatched. Wild Duck very numerous, but not so many Tufted as usual. No Shovellers.

Stone Curlews.—About the same as usual ; all appear to have hatched, in fact there have been more young birds seen than usual.

Finance.—Balance from 1918, £11 9s. 10d. ; Subscriptions and Bank Interest, £16 11s. 4d. ; Total Receipts, £28 1s. 2d. ; Expenses to Watchers, £17, leaving a balance in hand of £11 1s. 2d. The accounts have been audited by Mr. W. E. L. Wattam.

MAMMALS, AMPHIBIANS, REPTILES AND FISHES COMMITTEE.

Mr. F. Lawton, Skelmanthorpe, writes :—I have noticed a larger number of Water Vole, Water Shrew and Red Bank Vole, and fewer land mammals, probably owing to the rather cold season we have had.

Mr. W. J. Clarke reports that on February 2nd a specimen of the Lesser Forkbeard was picked up dead, but quite fresh, by Mr. F. Grant, in Burniston Bay, two miles north of Scarborough.

MARINE BIOLOGY COMMITTEE.

Mr. A. I. Burnley writes :—The members met at Scarborough from September 26th to September 29th. Investigations in the South Bay and at Carnelian Bay produced the following results :—Of the tunicates observed *Polyclinum aurantiacum* and *Botryllus babius* are new to the county list, and *Aplidium ficus*, previously recorded for Filey, is new to Scarborough.

Two specimens of the small hairy crab, *Pilumnus hirtellus*, were obtained. This crab had been previously recorded for Filey.

Caprella lobata, one of the Sessile-eyed Crustacea, was added to Scarborough's list as were also *Borlasia elizabethae* (a nemertean worm), and *Cycloporus papillosus* (a flat worm), the latter commensal on *Botryllus*. The tube-building amphipod, *Podoceros pelagicus*, new to Scarborough, was found on a Laminaria frond.

ENTOMOLOGICAL SECTION.

Lepidoptera.—Mr. B. Morley writes :—The past season has been one of the worst for many years. Only a few species appeared in any numbers, and many of the common Noctuæ and Geometræ apparently failed altogether, very notably *Abraxas grossulariata*. 'Sugar' also seems to have been almost a complete failure. In early June, in Edlington and Wadworth Woods, the larvæ of *Poecilocampa populi* were common, and those of *Taeniocampa munda* were abundant on ash trunks, a few *Asteroscopus sphinx* and many *Calymnia affinis* were taken from elm. In Wadworth Wood, a fine specimen of *Acronycta alni* was found, and in Edlington a specimen of *Dasychira pudibunda* proved that the species still lingers there. In June *Hedya neglectana* was taken for the first time at Skelmanthorpe, and in August a few *Tortrix cinnamomeana* were obtained at Dunford Bridge.

Dr. H. D. Smart, of Shelley, reports that many of his sleeved larvæ perished during the cold weather of July, including native *Spilosoma menthastri*. He also reports that *Polia chi*, *Tanagra atrata* and *Bryophila perla* were unusually plentiful in his district, and that he took *Plusia interrogationis* commonly at Robin Hood's Bay in July.

Mr. A. Smith, of York, reports *Acidalia straminata* from Strensall Common, in July, and a male *Colias edusa* from near Harrogate on September 28th. He found *Epione paralellaria* fairly plentiful at Sandburn, and also took a specimen of *Cosmia paleacea* in early September near York.

Mr. J. W. Carter reports that Mr. E. P. Butterfield took a specimen of *Plusia moneta* at Eldwick in August, and that Mr. W. P. Winter also took the same species in his garden at Saltaire in September.

Mr. G. T. Porritt reports a notable occurrence in the capture of *Choerocampa nerii* in King Street, Huddersfield, in early September. He has made four additions to the local list by the captures of *Elachista cerussella* in great abundance at Kirkheaton, *Laverna ochraceella* at the same place ; *Spilonota roborana* and *S. rosaecolana* from his garden at Dalton. *Amphysa prodromana* he found common on Meltham moors at Easter, and *Argyresthia curvella* at Dalton. Both he and I obtained *Nemeophila plantaginis* and *Spilosoma fuliginosa* on Harden Moss. *Acronycta megacephala* and *Cucullia verbasci* again occurred at Huddersfield, and the former also at Skelmanthorpe, being an addition to the local list. The larvæ of both *Vanessa urticae* and *Arctia caja* were very abundant in many parts of the West Riding in June.

Coleoptera.—Dr. W. J. Fordham writes :—A considerable amount of work has been accomplished in the order during the year, and many new species added to the county list ; a complete list of the interesting records will be published later in *The Naturalist*. Of outstanding note, however, it may be mentioned here that five specimens of the black variety, *funebris* Stm., of the Tiger Beetle, have been taken in a locality near Leeds, and also that the montane species *Miscodera arctica* Pk. and *Pterostichus lepidus* F. have been taken on Allerthorpe Common in the East Riding.

Hymenoptera, Diptera and Hemiptera.—Mr. J. F. Musham writes :—Aculeates of all kinds were conspicuous by their absence at Selby this season, excepting the latter part, when *Bombus lucorum* and *Vespa vulgaris* turned up everywhere. In July I took an example of *Crabro cribrarius* ♀ struggling hard to convey a specimen of the flash fly, *Sarcophaga carnaria*, to its nest, a heavy load for it.

Mr. Carter reports that at the Union's Meeting at Spurn *Ammophila sabulosa*, which is a new county record, occurred commonly to Mr. Cheetham, together with *Crabro cribrarius*, *Epiolus rufipes* (one), and *Bombus hortorum* v. *harrisellus*. A ♀ *Sirex noctilio* was given me which had been taken at Scarborough by Mrs. Haigh Lumby ; on examination

it proved an interesting monstrosity. It had the entirely normal black antennæ, but springing from the apex of the basal joint of the right antenna was a third, about half the normal length, colour wholly testaceous.

Mr. R. Butterfield reports that males of the local and variable *Bombus sorõensis* were found not uncommon at Grassington, and a new var. of a *Psithyrus* was secured. The spring Andrenas and Nomadas were very abundant, though no new species were obtained. From pupæ secured at Buckden I bred a female of *Pompilus approximatus*. There are eight additions to the Saw-flies. Mr. C. A. Cheetham caught the handsome *Abia candens* at Austwick Moss in June. A new member of the same genus, *Abia lonicerae*, I caught at Barden-in-Wharfedale in May. Mention should be made of a record of the new British Saw-fly from Arncliffe, *Lyaeonemata westmaeli* Tischb. I have caught a few specimens of the curious wingless hymenopteron *Proctotrypidae*, but they have not been identified as well as other species which will require the services of the Union's referees.

Mr. C. A. Cheetham writes that he has many additions to the Diptera list which he hopes to bring forward shortly in a note to *The Naturalist*.

Neuroptera.—Mr. G. T. Porritt writes :—Three specimens of the dragon-fly, *Sympetrum sanguineum*, were taken by Mr. Morrell, between Baildon and Hawksworth, on August 30th, 1919, and determined for him by Messrs. J. W. Carter and J. Beanland, the latter of whom sent one to me for confirmation. The species has not hitherto been recorded for Yorkshire, and moreover considerably extends its range northwards in Britain. Dr. W. J. Fordham has taken *Taeniopteryx nebulosa* at Bubwith this year, a species previously only recorded from Pickering. He also took *Nothochrysa capitata* and *Rhapidia xanthostigma* in the same district.

Arachnida.—Mr. W. Falconer writes :—Much of the work accomplished during the year has already been recorded in *The Naturalist* in the Report of the Meeting held at Hawes and neighbourhood, (Sept., pp. 305-6), 24 species being added to the list of V.C. 65, and in ' New and Rare British Spiders,' pp. 295-302, two spiders new to science being described and figured. ' The Spiders of Yorkshire ' continues its serial publication. In August, Mr. T. Stainforth forwarded for identification a number of spiders collected in the eastern parts of the county. These included three species new to V.C. 62, the false scorpion, *Chernes dubius* Camb. from Hayburn Wyke ; *Theridion vittatum* Walck. and *Xysticus kochii* Thor., both males, from the Forge Valley ; and one new to V.C. 61, *Ero cambridgii* Kulcz., the first Yorkshire male, from Roos bog, as well as the rare (as Yorkshire species) *Prosthesima apricorum* L. Koch. and *Sintula cornigera* Bl., both females, from the former locality. A later gathering from Allerthorpe Common, V.C. 61, contained two rare spiders new to the county, *Gnaphosa anglica* Camb. ♀s, and *Pirata piscatorius* Clerck. ♀ and a third new to the division, *Xysticus sabulosus* Hahn. In the Huddersfield district, *Evansia merens* Camb., a myrmecophile, and *Caledonia evansii* Camb. have been found more generally distributed ; *Maro minutus* Camb. in its only world stations, and *Gongylidiellum latebricola* Camb. in Honley Old Wood still maintain their positions. *Clubiona brevipes* Bl., a rare species in the county, at Bentley Springs, *Oxyptila trux* Bl. and *Agroeca proxima* Camb. at Woodsome are new to the area. The mites have not been neglected, several of those found belonging to species which are awaiting description. The gall mites have come in for special attention ; they now total, from all sources, forty different kinds. Many are recorded in the Plant Galls from Wensleydale and Scarborough shortly to be published. Water mites have altogether escaped notice, there being only two old records for the county. Conchologists and microscopists could render valuable service by bottling the examples they meet with while dredging, not forgetting those which make a home inside the shells of certain bivalves.

BOTANICAL SECTION.

Mr. J. F. Robinson writes :—Your Secretaries are pleased to report that, during the past year no less assiduity and enthusiasm than formerly have characterised the workers in this section, as very well appears from the excellent and extensive reports that the Secretaries have been privileged to receive from members of widely separated affiliated societies, as well as the reports of Y.N.U. excursions and special articles in *The Naturalist* and elsewhere. Amongst the notes from Dr. F. A. Lees is reference to an *Epibactis* (*atro-viridis* Linton) as 'spreading,' and to *Sanguisorba officinalis*, Lady's Mantle *Alchemilla vulgaris*, the English Mandrake, *Bryonia dioica*, as amongst 'lost-or-almost gathered to death plants' that are reappearing in West Riding localities. Dr. Lees also discourses upon questions of 'outlying distribution,' and 'reliquarial persistence.' the instances mentioned being '*Gentiana verna* in Cleveland,' *Cornus suecica* and *Carex pauciflora* in the Lilla-Cross (N. Riding) district, *Goodyera* in the East Riding and the spreading of *Arenaria ciliata* var. *gothica* and the tall thistle-rape, *Orobanche reticulata*, near Thorner.

According to all reports the lateness of the spring of 1919 and the consequent blossoming of plants was everywhere very marked, *e.g. Saxifraga oppositifolia* not even on 21st April. From May onwards, however, there was a long spell of drought with much sunshine. Blackthorn and Hawthorn flowered very fairly profusely and a good crop of fruit of both has resulted. Pears are a very heavy crop this season. Other rosaceous plants like raspberry (wild) flowered and fruited but attained scarcely any degree of succulency. Of the June and July flowers, especially of Wild Rose, Honeysuckle, Meadowsweet, etc., the profusion was greater, perhaps, than in any season within memory. The big crop of 'hips' now observable is the natural consequence.

It may be noted that Oak, Sycamore, Ash, Elm (Wych), Horse Chestnut, and Beech have generally fruited fairly well, although in the case of the first and the last the crop of fruit is considerably below par.

For the East Riding, quite a number of new stations and confirmations of interesting old ones can be reported as due to increased vigilance of local societies. The following may be mentioned :—*Radiola linoides*, *Lathyrus palustris*, *Erica mediterranea* (introduced), *Gentiana Pneumonanthe* and *G. campestris*—the three last on the Great Sand Field, south and west of Market Weighton—*Atropa Belladonna* on the chalk, *Utricularia vulgaris*, *Carices paradoxa*, *axillaris* and *Pseudo-cyperus*, together with the (we fear) fast vanishing fern *Lastraea Thelypteris* in or near the open drains or in marshy places of Holderness.

Mr. W. B. Haley remarks on the paucity of aliens this season, although *Acorus calamus* is vigorous in the Ravensthorpe quarter (W.R.).

Botanical Survey Committee.—Mr. W. H. Burrell writes :—For the past three years periodical visits have been made to the turbary pits on Austwick Moss. Until this summer the water level has shown no extreme variation, but the recent dry season has lowered it about eighteen inches. Submerged vegetation in the several pools under observation consists principally of algæ, mosses, liverworts and lesser bladderwort, with a few plants of broad-leaved pondweed and floating bur-reed in the deepest pool; common cotton-grass is well established in some. The relationship of algæ to sphagnum has been a problem; the latter has been so heavily encumbered as to appear to be a losing competitor, but it is still an open question whether the association of the two is competitive or whether the algæ may not be using food material to which the sphagnum is indifferent. Dr. Corbett reports that the Martin Beck survey is now as complete as it is likely to be and only wants writing up.

Dr. Woodhead sends the following note :—The Rev. James Hughes in his history of Meltham (1866 p.2) records that 'fir wood was dug up out of the moors (*i.e.* above Meltham) in hundreds of cart loads and used

as torches by the cottagers.' Some doubt has been thrown on this record, mainly due to the absence of recent corroborative evidence. In March last, however, in the company of Miss Elsie D. Whitaker, M.Sc., we found a quantity in the peat near the reservoir at Deer Hill, which on microscopic examination proved to be Scots Pine. At this place, remains of Birch are also abundant in the peat.

Bryology.—Mr. W. Ingham, B.A., reports that he found *Sphagnum auriculatum* var. *tenellum* and *S. aquatile* v. *mastigocladum* above Ravenscar; also *S. recurvum* v. *robustum* forma *strictifolium* above Ravenscar, and *S. crassicladum* v. *intermedium* f. *ovalifolium* on Skipwith Common. Skipwith Common is the only habitat for a very interesting Harpidium, *Hypnum fluitans* var. *Lindbergii* abundantly fruiting. The other moss, *H. fluitans* var. *Mildeanum*, grows four miles from York.

Mycology.—Mr. A. E. Peck writes :—During the year this Committee has been represented at the various Excursions of the Union and small collections of Fungi have been made. At the Pateley Bridge meeting Mr. M. Malone recorded *Cordyceps capitata* ' on the body of a fly ' (*see The Naturalist*, Sept., 1919). The usual host is the subterranean ' false truffle ' *Elaphomyces granulatus*. Massee appears to have regarded *Cordyceps capitata* as parasitic upon Fungi only, as in dividing the old genus *Cordyceps* into (i) those species parasitic upon insects, under the existing name of *Cordyceps* and (ii) those species parasitic on fungi under the new generic name of *Torrubia*, he places the species in the last-named group. (' British Fungi,' p. 513). There are photographs of *Cordyceps capitata* by Wager and Peck respectively, with notes in *The Naturalist*, July, 1915 (No. 702), p. 223. By the death of Anthony Wallis, M.A., the Committee has lost an enthusiastic Mycologist, who had made a special study of the Fungi of Cumberland, and had, in recent years, taken a keen interest in Yorkshire Fungi. His presence at our meetings was always welcome, where his genial kindly manner endeared him to all. The death of Thomas Gibbs is a great loss to our Mycological Committee. He was one of our most prominent and enthusiastic workers, and had a large acquaintance with the Yorkshire Fungus Flora. Owing to the Railway Strike very few members were able to attend the Annual Fungus Foray at Helmsley, but nevertheless some useful work was done, and new records for the district made. An account will appear in *The Naturalist*. The Chairman of the Committee has been appointed Honorary Lecturer in Mycology at the University of Leeds.

GEOLOGICAL SECTION.

Mr. John Holmes reports :—The Section has been represented on all the week-end Excursions. During the year, progress has been made with the zoning of the Pendleside Series, and with the investigation of the marine bands of the Millstone Grit and Coal Measures. It has been suggested that when recording the occurrence of any fossil, the height above O.D. should be given in addition to locality and horizon. Data obtained by this method would be valuable in districts where boring or mining operations are contemplated.

Coast Erosion Committee.—Mr. J. W. Stather writes :—For well-known reasons, the members of this Committee have not been able to do much work. during the war Now, however, the war restrictions have been removed, a few notes have been made.

Robin Hood's Bay.—New falls of boulder clay have been noted at one or two points in the cliffs south of Bay-town. The harder Lias cliffs also show signs of recent wear and tear. This is very noticeable in the neighbourhood of the path up the cliff near the old peak alum works, the lower part of this path having almost entirely disappeared.

Blea Wyke.—The beach immediately north of the headland is covered with recently fallen blocks of estuarine sandstone, which appears to have come from 500 feet above. The path down the cliff at this point is buried under the heap of talus.

Cayton Bay.—A fall of thousands of tons of the Lower Calcareous Grit has recently occurred at Red Cliff, close to the fault.

Flamborough Head.—Big falls of the chalk cliffs in the neighbourhood of Bempton are reported to have occurred during the last two or three years, but no particulars have come in yet.

Holderness.—Severe erosion has occurred on the Holderness coast during the last four or five years, and much valuable land has been lost along the whole cliff line from Bridlington to Easington. On the other hand south of Easington, towards Kilnsea and Spurn, the erosive action of the sea has been checked. The groynes, sea-walls and other sea defences erected by the military along the Spurn peninsula have successfully obstructed the natural southward flow of the beach material, the result being that there are now formidable banks of sand and shingle opposing the advance of the waves, from Easington southwards.

Jurassic Flora Committee.—Mr. J. J. Burton writes :—A small amount of work continues to be done in the investigation of local fossil-flora-bearing areas in Cleveland, but the only new locality which has been found during the last year is near Stonegrave in the Lealholme district, where in a ganister quarry several curious cup and cone structures have, from time to time, been met with, the origin of which is, at present, undetermined.

In the same quarry a number of imprints of *Williamsonia gigas* and of a form of *Otozamites*, have been met with, and further investigation will be made.

British Association.—Mr. T. Sheppard, M.Sc., reports :—I had the pleasure of representing the Yorkshire Naturalists' Union at both the meetings of the Conference of Delegates of Corresponding Societies, held at Bournemouth on September 11th and 12th, and at one meeting had the honour of taking the Chair during the absence of the President. The subjects discussed were : 'Roads and the History of Locomotion,' by the President, the Rt. Hon. Lord Montagu of Beaulieu; 'Atmospheric Pollution of Towns,' by Dr. J. S. Owens; 'The Measurement of Rain,' by Mr. C. Salter; and 'The Importance of including Geography in the Curriculum for Higher Education,' by Mr. T. W. F. Parkinson. The addresses and discussions were of importance and of profit to those present, but I know of no particular points needing the attention of the members of the Union. I am pleased to report that since the Bournemouth meeting the Hull City Council has sent an invitation for the British Association to visit Hull in 1922.

Soppitt Memorial Library.—No report.

The Naturalist.—It is particularly satisfactory to record that the Union's journal has maintained its valuable publication of important researches, as well as many articles of pleasing and profitable reading to the lover of nature. Thanks are again due to Mr. Thomas Sheppard, M.Sc., for supplying, entirely free of cost, the blocks in illustration of some of his various contributions.

The Presidency for 1920 has been offered to and accepted by Prof. J. E. Marr, D.Sc., F.R.S., Cambridge. The Union wishes to record its indebtedness to the retiring President, Dr. W. G. Smith, B.Sc., for his zeal in promoting the welfare of the Union.

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

STATEMENT OF INCOME AND EXPENDITURE, 12 months to November 24, 1919.

INCOME.

	£ s. d.	£ s. d.
Members' Annual Subscriptions, arrears	6 18 0	
,, 1919	68 17 6	
,, 1920	2 14 0	
		78 9 6
Life Members' Subscriptions (*contra*)		14 14 0
Levies from Associated Societies, arrears	2 1 0	
1919	8 9 0	
		10 10 0
'Naturalist':—		
Subscriptions arrears	8 8 0	
1919	85 4 0	
,, 1920	3 12 0	
		97 4 0
Sales of Publications		0 2 0
Bank Interest		3 4 9
Special Appeal at Annual Meeting, 1918		14 1 6
Balance, being excess of Expenditure over Income		14 19 2
		£233 4 11

EXPENDITURE.

	£ s. d.	£ s. d.
Expenses of Meetings		8 5 2
Printing and Stationery (General A/c)		24 0 9
Postages, etc. (Hon. Secretaries A/c)		12 11 8
Clerkage, ,, ,,		10 0 0
Printing and Stationery (Hon. Treasurer's A/c)		1 17 6
Postages, etc. ,, ,,		1 7 3
PUBLICATIONS:—		
Annual Report, 1918 ...	12 18 6	
,, (est.) 1919	14 0 0	
	26 18 6	
Less—Provision A/cs, 1918	14 0 0	
		12 18 6
'NATURALIST':—	£ s. d.	
Members' Copies ...	109 7 6	
Exchanges	3 18 0	
Editor's Postages etc. ...	9 15 9	
Extra pages	6 18 0	
Binding	1 1 0	
Extra Postage	10 3 10	
Printing Sundries ...	6 6 0	
		147 10 1
Life Members' A/c (*contra*)		14 14 0
		£233 4 11

BALANCE SHEET, November 24, 1919.

LIABILITIES.

	£ s. d.
Amounts owing by Union—	
'Naturalist' ...	62 17 0
,, Editor's Postages	3 15 9
Annual Report, 1919 (estimate) ...	14 0 0
Subscriptions received in advance ...	6 6 0
Life Members' A/c	104 7 0
'Hey' Legacy A/c	20 0 0
Balance, being excess of Assets over Liabilities	61 6 2
	£272 11 11

Examined and found correct,

ALBERT GILLIGAN,
J. DIGBY FIRTH.

Nov. 28th, 1919.

ASSETS.

	£ s. d.	£ s. d.
Cash at Bank	125 11 0	
Cash in hands of Hon. Secs.	5 0 10	
Cash in hands of Hon. Treas.	1 2 7	
		131 14 5
War Savings Certificates—		
£100 (Feb. 12/17) cost £77 10s.; present value, say	87 10 0	
£25 (Jan. 1919) cost £19 7s. 6d.; present value, say ...	19 7 6	
		106 17 6
Subscriptions in arrears ...	41 11 6	
Written off as unrealisable	7 11 6	
		34 0 0
		£272 11 11

E. HAWKESWORTH,
Hon. Treasurer.

NORTHERN NEWS.

We are glad to see that Mr. C. Davies Sherborn, whose well known bibliographical work is so frequently used by naturalists and so rarely acknowledged, has been elected an honorary member of the Metropolitan Museum of Art, New York.

We take the following from the minutes of the Beverley Library, etc., Committee :—' The Chairman reported that he had purchased *several old pictures* for the Art Gallery, at the sum of 14/6. Resolved, that the action of the Chairman be confirmed.'

Our readers familiar with the natural history charms of Hornsea Mere will be interested in the following letter sent to the Press by Mrs. Strickland Constable :—' The Disposal Board of the Ministry of Munitions are advertising Hornsea Mere for sale. In order to save intending purchasers trouble I should like to point out that this is my property and that I do not propose either to sell the Mere, or to acquiesce in the sale of it.'

By calling a single paper of 50 pp. (on the evolution of the Liparoceratidæ, by Dr. A. E. Trueman) and a few plates on thin cardboard, with an index of xii. pages, a ' Quarterly Journal,' the Geological Society of London should be able soon to bring its publication up to date ; but even this can hardly be done if the ' journals ' do not appear more frequently than four times a year—the last four parts—published during 1919, being really ' for 1918.'

Writing to *The Yorkshire Post* in reference to the summary of the Report of the Yorkshire Naturalists' Union which there appeared, Miss F. M. Bulman, of Saltburn, states, ' I notice Mr. Clarke says cormorants have not been so numerous as other years in the North Riding. It has been just the contrary here in Saltburn. I have not seen so many on our cliffs in all the nineteen years I have been here, and several people have remarked on the same thing.'

We learn from the Press that the trustees of the London Museum have appointed Mr. F. A. Harman Oates as keeper, secretary and accounting officer, in the place of the late Sir Guy F. Laking, and Colonel the Hon. M. V. Brett, deputy-keeper and librarian. Mr. Harman Oates was formerly assistant secretary to the London Museum under Sir Guy Laking, and Colonel Brett is the second son of Lord Esher, *and the husband of Miss Zena Dare, the well-known actress.*

We learn from the Press that damage estimated at £5,000 has been occasioned by high tides on the Lincolnshire Coast near Skegness. Between Gibraltar Point and Ingoldmells Point—a distance of about eight miles—the sea has made considerable inroad in places and a breach of 200 yards has been made in the sea bank. Thousands of tons of earth and sand have been washed away, huge timber piles and breastworks moved, and hundreds of acres of land flooded.

When we referred to Prof. J. E. Marr's general scientific knowledge (*The Naturalist,* December, p. 379) we little expected to see the announcement on two different pages in *The Yorkshire Post* for December 8th (duly copied in certain evening papers), that Prof. Marr took as the subject of his Presidential Address to the Yorkshire Naturalists' Union ' The Naturalist and the Gardener.' That subject seems more appropriate for the retiring president, Dr. W. G. Smith.

In a letter published in *The Times,* Sir Alfred Keogh, Rector of the Imperial College of Science and Technology, calls attention to the increasing demand for well-trained entomologists. This is welcome evidence that knowledge of insect life, formerly regarded as a harmless and somewhat ridiculous hobby, is now recognized as having great practical value. Insects, as the carriers of disease, and as the friends and foes of agriculture and horticulture, play a large part in human affairs, and it is only by knowledge that we can set limits to their harmfulness and encourage their helpfulness.

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London. Jan. 1st, 1920.

FEB. 1920. No. 757
(*No. 531 of current Series*).

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF

NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

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

Contents :—

LONDON:
A. BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.
Printers and Publishers to the Y.N.U.

Price 9d. net. Prepaid Subscription 8/6 per annum.

YORKSHIRE NATURALISTS' UNION.

VERTEBRATE SECTION.

President : A. HAIGH LUMBY, Esq., SHIPLEY.

MEETINGS will be held on SATURDAY, FEBRUARY 21st, at the Co-operative Society's Rooms. Albion Street, Leeds, at 3-15 and 6-15 p.m. respectively. All previously associated with the Section and others interested, are invited.

The following have promised to contribute :—

S. H. SMITH, York : 'Notes of a Naturalist in W. Africa.'
C. F. PROCTOR, Hull : 'The Amphibia and Reptilia of East Yorkshire.'
Dr. W. GARSTANG, Leeds : 'A recital of his songs of the Birds.'
E. W. TAYLOR, York : 'Some notes on the Trout, Salmon Trout and Salmon.'
H. B. BOOTH, Ben Rhydding : 'The curious distribution of Reptilia in Upper Airedale and Upper Wharfedale.'

WITH LANTERN.

S. H. SMITH : Set of slides.
R. FORTUNE, Harrogate : 'Life in a Tern Colony.'
T. M. FOWLER, Barnsley, and R. CHISLETT, Rotherham : 'The Stone Curlew observed and photographed in Suffolk.'
R. CHISLETT : 'The breeding habits of a pair of Merlins from eggs to flight of young.'

Lantern slides, photographs, specimens and brief notes of interest, invited.

WALTER GREAVES, *Hon. Sec.*,
1 Chapel Avenue, Hebden Bridge.

BOOKS WANTED.

Kendal Ent. Soc. 3rd Report.
Lancs. and Cheshire Antiq. Soc. Vols. IV., V., VIII., XXVI.
Louth Ant. and Nat. Soc. Reports, 1-12, 19.
Liverpool Marine Biological Com. 1st Report.
Liverpool Geol. Association Proc. Parts 1, 3, 16.
Liverpool Nat. Journ. Parts 1, 3, and 20.
Manchester Geol. Soc. Trans. Vols. XV., XVI., XIX.-XXIII.
Marine Biological Assoc. Journal. Vol. I., Pts. 2 and 3.
Naturalists' Guide (Huddersfield). Parts 1-38.
Naturalists' Record. Set.
Newbury District Field Club Transactions. Vols. III. and on.
North Staffordshire Field Club Reports for 1869, 1871-2, 1876.
Peterborough Natural History Society. Reports 1-8, 11-12, 14-26.
Quarterly Journal of Science. 1878-9, 1882-3, and 1885.
Quekett Club Journ. 1st Series, No. 25.
Royal Cornwall Geological Society Trans. Vol. V. to date.
Salisbury Field Club. Transactions, Vol. II.
Scottish Naturalist. 1881-1891.

Apply—**Editor, The Museum, Hull.**

BOOKS FOR SALE.

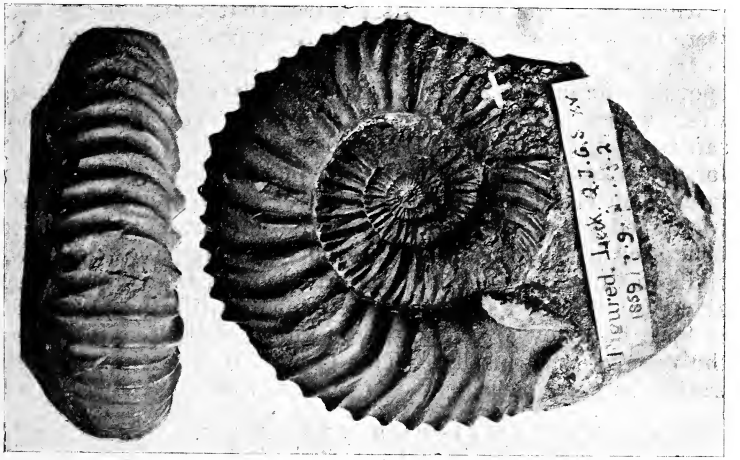
REPORT ON AGRICULTURAL DAMAGE BY VERMIN AND BIRDS IN THE COUNTIES OF NORFOLK AND OXFORDSHIRE IN 1916. R. T. Gunther. 1/6
HUNTING IN BRITISH EAST AFRICA. Madeira. 10/-
SPENCER FULLERTON BAIRD. By Dall. 7/6
THE GREATEST LIFE. Leighton. 3/-
THE YORKSHIREMAN. By a Friend. Vol. I., Pontefract, 1833. 3/6
DERBY: ITS RISE AND PROGRESS. Davison. 2/6
ANIMAL ROMANCES. Renshaw. 4/-
NATURAL HISTORY OF ANIMALS, 8 vols. 4/6 per vol.
THE SCIENTIFIC ENQUIRER. Cloth. Vols. I. and III. 2/- each.
THE MAKING OF SPECIES. Dewar and Finn. 4/-

Apply—**Dept. C, c/o A. BROWN & SONS, Ltd., Hull.**

NOTES AND COMMENTS.

TYPE AMMONITES.

Part XX. of Mr. S. S. Buckman's *Type Ammonites* (pp. 7-8, 14 plates, 10s.) has been published and includes descriptions of a number of Ammonites, with excellent figures from photographs by Mr. J. W. Tutcher. Many of the species are familiar to Yorkshire Geologists, though only a few Yorkshire examples are actually illustrated. Among them is the specimen reproduced herewith, beneath which is the following :—Ammonites reversus (Simpson, MS.), Leckenby 1859, Holotype Q.J.G.S., xv., 7, 9, 15 ; 1, 2 ; The Castle Rock, Scarborough, Yorkshire ; ['] Kelloway Rock' (brown ool. calc. with irony sand) ; Sedgwick



Mus., Cambridge (Leck. Coll.) ; S. 53, 28, 30, 43, Cf. XCIX. Rursiceras reversum, Simpson-Leckenby sp. Callovian, *athleta* ; Genotype.

BRYOPHILA PERLA.

At a recent meeting of the Lancashire and Cheshire Entomological Society, Mr. Mansbridge shewed a long series of *Bryophila perla* from Wavertree, taken from about 300 yards of red sandstone wall sparsely covered with light grey lichen. The moth was in unusual plenty in August, 1919, and was exceptionally variable. The exhibit comprised bright yellow, orange-mottled forms with the black markings reduced ; bright green mottled with darker, the black normal ; specimens with the usual ochreous ground colour of a greenish-grey ; also some with all the markings very much intensified and a few almost unicolorous, pale ochreous examples. There was no orange coloured lichen on the wall neither has any been

seen elsewhere in the neighbourhood. Mr. S. Gordon Smith shewed a fine brick-red variety of *Himera pennaria* from Chester, an apparently wingless female of the same from Delamere, and uncommon forms of *Hibernia defoliaria* from Delamere.

ANCIENT CIVILISATION.

We take the following from the *Bridlington Free Press* :— The late East Riding naturalist, the Rev. F. O. Morris, of Nunburnholme, wrote in 1892 that 9000 kittiwakes were slaughtered in a fortnight to provide feathers for hats, the cruelty being heightened by the fact that they were shot in the nesting season. Mr. Morris prophesied that ladies would never wear the wings of a kittiwake again. Miss Lydia Becker learning from the British Association that many of the birds were caught in the act of feeding their young, said ladies did not know this, and protested against her sex being held responsible for such cruelty, and said no lady would ever willingly wear wings again. Both the prophets were wrong. It is safe to say that some species of birds have been utterly destroyed for the sake of their feathers, and places where birds used to be seen in clouds are now deserted or else tenanted by a few frightened pairs. We considered the ancient Egyptians poor benighted heathens, and we are ourselves humane and highly civilised Christians. Yet Herodotus tells us that birds walked about the crowded streets of their towns with the familiarity of barn door fowls, and any who killed or injured them paid the penalty with his life. This is one direction in which the world has gone back.

ENTOMOLOGICAL MAGAZINES.

With regard to our remarks in *The Naturalist* for November, (pp. 346-7), we have received many letters from entomologists agreeing with the suggestions there made, and we learn that some of our leading zoologists are attempting to bring about some such amalgamation. *Against* the suggestion we have only seen one criticism, and as might be expected, it is from one of the magazines concerned. In the *Entomologist's Record* for December 15th is the following illuminating paragraph : ' How very kind *The Naturalist* of November is. It actually wishes to settle all our business for us. It suggests that even the editors of various magazines should be pooled. " We dont (*sic*) think." ' We do not know which of the *eleven* editors of *The Entomologist's Record* is responsible for this gem, but if their December number is to be taken as a type of its publication we would strongly urge the elect eleven to consider amalgamation before elimination, as the charge, 1/6 net, for 16½ pages of text and three pages of index is ' asking for trouble.' True, there is what is described in

eight different places as a ' Plate,' though we never previously remember seeing such childish sketches in a scientific magazine, and with the ' artist's ' initials added ; and we can quite assure our contemporary that we have no desire " to ' settle ' *all* its business."

MIGRATION AS A BIOLOGICAL FUNCTION.

With the above heading Mr. F. J. Stubbs has a somewhat remarkable paper in the Transactions of the London Natural History Society, just received. He writes :—' I call migration a function. It is more than a mere instinct or a habit ; it is by no means confined to birds ; and its influences reach the life of all organisms, animal or vegetable, which inhabit the earth. The first point to be remembered is that migration as a study should not be the monopoly of the ornithologist, and that the phenomenon is more intimately bound up with the science of botany. The second point is the magnitude of the process of migration, so far-reaching that it exceeds in importance every terrestrial manifestation with the exception of life itself. As migration is based on plant life it may be necessary to present a short sketch of one or two facts in elementary vegetable physiology. If one asks a man for his opinion on the source of plant food he is almost certain to mention the soil, and to omit the other factors. Really, of the four prime plant needs, soil is the least important, and is dispensed with by the many rootless aquatic plants which exist in the sea or in fresh waters. A better answer would substitute for the term ' soil ' the various *inorganic* substances which are needed by the plant, and which can be derived only from the earth, and then only in the form of watery solutions. Water is thus another of the four essentials. No plant can develop without it, and in a frozen land, or in a perfectly dry desert, either sandy or rocky, no vegetable can live.'

POLITICAL OIL.

The following, taken from a local paper, is the sort of oil poured over the electors of Central Hull by its recently elected member :—' Possibilities of Hull becoming an oil port were sketched by Commander Kenworthy, M.P., at the annual meeting of the Hull Incorporated Chamber of Commerce and Shipping. He said very shortly there would be a considerable output of oil in this country. It was expected that oil would be struck on the south side of the Wash, and Hull would become a *very convenient port* for the shipment of oil. The ports on the south side of the Wash were not suitable for large ships. *He did not know*, but he supposed a pipe line could be run from Norfolk, or wherever the oil was struck, to Hull, where the trade, which would become vitally necessary, could be developed. First ' catch your oil,' and if this should be achieved

we doubt very much whether there would be a sufficient quantity to pay for the pipe from Norfolk to Hull—then there is the engineering difficulty of pumping the oil up hill and down dale a matter of 85 miles—and why cross the Humber with the pipe (never mind how!) when Immingham, on the Lincolnshire side, is capable of dealing with all the oil that the Norfolk area can supply. We have had to swallow a good deal lately, but we draw the line at Norfolk Oil!

LITERARY AND PHILOSOPHICAL SOCIETIES.

We should like to endorse the remarks made by Sir Henry A. Miers at a recent meeting of the Manchester Literary and Philosophical Society. He especially directed attention to the urgent need in societies for informal discussions, a work performed by such societies in their pioneer days. With the increase of scientific knowledge, the tendency has been for scientific people to segregate into special groups. As a result of this, the papers read at modern specialist societies are calculated to appeal only to experts. A reaction is indicated by recent attempts at co-operation between the humanities and sciences. Great work could be done by making the most recent advances in science understood by those who were not experts, and by promoting meetings at which new ideas can be expressed in language intelligible to all. There is danger of a scientific hierarchy, and of a cleavage between specialists and amateurs. Investigators might be encouraged to give popular expositions of their own discoveries to a general audience, in addition to the more severely scientific paper intended for publication.

THE BRITISH MUSEUM OF NATURAL HISTORY.

It is a matter for sincere regret that after its recent severe remarks on the appointments made to the British Museum *The Times* has again been compelled to re-open the question. The filling up of scientific posts by 'Middle-aged mediocrities' still continues, to the detriment of the Institution and its properly elected staff. The very ugly word 'patronage' is freely used in two of these cases. Is it not possible to make a fresh start by transferring some of the 'mediocrities' to another office, *e.g.*, the Treasury, or some other clerical office, where technical knowledge is not a qualification, and filling the vacancies with young men by the proper method of examination by the Civil Service Commissioners, after, perhaps, a careful selection of candidates by a properly constituted competent body of scientific men.

——:o:——

The Annual Report of the Yorkshire Naturalists' Union has been reprinted from *The Naturalist* for January, and is for sale at one shilling.

A PRELIMINARY STUDY OF THE STRATIGRAPHY OF THE MILLSTONE GRIT.

W. S. BISAT.

Drs. Wheelton Hind and Wilmore have established a faunal succession for the Upper Carboniferous of the Clitheroe Province (*Abs. Proc. G.S.*, No. 1029, Dec., 1918), and a portion of this succession has been tested by investigations made by the writer (largely in conjunction with Dr. Hind) in the Grit beds between Halifax and Derbyshire, as opportunity has offered during the last year.

So far as these investigations have gone they have considerably strengthened the faunal succession established for the above type area, and at the same time introduced an entirely new conception of the nature of the Millstone Grit stratigraphy.

In view of the increasing attention now being paid to the Millstone Grit beds by workers in Yorkshire, it may possibly be of assistance to others to indicate the principal tentative conclusions arrived at by the writer as a result of the above field work, and that of earlier years in the Masham area.

Lithological Stratigraphy.—The most important contributions to a study of the stratigraphy of the Grits consist of :—

(1) The various Geological Survey Memoirs and maps.
(2) Papers by J. R. Dakyns published in *Proc. Yorks. Geol. Soc.*
(3) Sporadic papers by local workers ; the most valuable being those by Spencer on the Halifax area ; and by Barnes and Holroyd dealing with beds near Marsden.

A careful study of the Memoir on the Yorkshire Coalfield, and of the diagrammatic N. to S. section of the grits accompanying it (facing p. 32) shews that the Survey conceived of the Millstone Grit deposits as a definite sequence of alternating coarse and fine beds, in descending order as under :—

(*a*) A very regular Rough Rock capping the whole.
(*b*) Middle Grits and intervening shales, simple in sequence in Derbyshire, but complex in Yorkshire.
(*c*) A Kinderscout Grit forming a basement, and filling up hollows in an irregular underlying floor.

This view may be taken as fairly representing the conception that has been formed of the Grit series up till practically the present day. I believe some have argued, and more or less cogently, that the correlations made by the survey of various exposures of K. Grit were not above suspicion, but have not, so far as I know, advanced any facts in disproof of the Survey stratigraphy. In fact it is doing no injustice to local workers to state that it was impossible for them to dispute correlations

of strata based on a far wider experience than they could possibly obtain.

Faunal Stratigraphy.—The extremely limited vertical range and retiring nature of the fossiliferous beds in the Grits has made them difficult of detection; and consequently collections of the Millstone Grit fauna have been of such a sporadic character that no faunal sequence had been observed until we were placed in possession of Dr. Hind's valuable paper on the Pendle area (*Abs. Proc. G. S.* No. 1029, Dec., 1918).

A perusal of Dr. Hind's previous summary of the Grit fauna (*The Naturalist*, 1907, pp. 90-96) shews clearly how sporadic the collections had been; and the subsequent papers by Mr. Wilson on marine bands in the Washburn area, and by the writer in the Masham area, brought no evidence of a faunal succession, for the simple reason that no *succession* of marine bands had been observed in any one district; except, perhaps, the two in the Masham area (where the upper band—the Cayton Gill beds—has an anomalous phase deficient in index Goniatites).

In the Pendle area Dr. Hind shewed the Grit sequence to consist of:—

Rough Rock.
'*listeri*' shales.
3rd Grit.
'*beyrichianum*' (Sabden) shales.
Kinderscout Grit.
'*bilingue*' shales
'*spirale*' shales } Bowland shales.
'*reticulatum*' shales

Investigations of the faunal sequence have been made during the year 1919, in various areas on the eastern flank of the Pennine watershed from the Halifax area in the north, to the Yorkshire-Derbyshire boundary in the south, and although the collecting points have necessarily been somewhat scattered, they have given most interesting and unexpected results.

It would appear that:—

(*a*) The area to the west and north-west of Halifax comprises rocks of very late Grit age. The earliest beds seen (in Crimsworth Dene) are probably of late '*beyrichianum*' time (*see* Dr. Hind's suggestion in *Abs. Proc. G. S.*, No. 1029, December, 1918, p. 19), and are very closely linked in faunal character with succeeding marine bands right up to the '*listeri*' shales.

This peculiar expansion of beds of late age is probably local, and explains Spencer's inability to detect any real faunal succession, though I consider that his views

on the gradual expansion of '*listeri*' as the succession is ascended will probably prove to be sound.
The beds may have been formed in a landlocked bay, for the fauna remains curiously constant.

(*b*) The area west of Holmfirth is much older, the '*reticulatum*' and '*bilingue*' zones probably both being represented. These beds are faunally the earliest Grit beds so far recognised.

(*c*) The beds in the eastern part of the Emden valley are entirely of '*bilingue*' age up to the White Lee Moor Rock, above which they have not been examined.

(*d*) The Yorkshire-Derbyshire border forming the north side of the Derwent valley gives late '*bilingue*' to '*beyrichianum*.'

'*b*,' '*c*,' and '*d*' are probably all succeeded more or less discordantly by '*listeri*' shales underlying the Rough Rock, whilst the Halifax area on the other hand exhibits a gradual transition up into '*listeri*' times.

It is obvious that these results (if confirmed by later investigations in other areas) completely alter the point of view from which we must examine the Grit sequence. Instead of the conception underlying the Survey stratigraphy, that the whole area of deposit was a unit, we are faced with an entirely different and more complex proposition, yet one which on reflection seems more in accord with what on *a priori* grounds might have been deemed probable.

In view of the fact that taking the sequence as a whole, there is far more shale than sandstone, that is more fine stuff than coarse stuff, and as fine stuff and coarse stuff must have been coming down from the hills *at the same time*, we are driven towards one of two alternatives :—

(*a*) The exposed area of the grits is such a relatively very small portion of the deltaic area, that the fine stuff of 'K' time and 'R.R' time is completely hidden by later deposits,

or

(*b*) We require a fundamental revision of our conception of the Grit stratigraphy.

Considering the enormous exposed area of the Grits, I think the latter is much the more probable.

Instead of conceiving of the area as a unit area of deposition we must think of a number of separate deltas built up practically independently ; coalescing, interlacing and no doubt overriding one another, and formed of similar constituents, but yet in many cases retaining an individuality, and by their entombed fauna revealing their differing ages.

The boundaries of these confluent deltæ ought to be capable

of detection, and I believe in several cases evidence bearing on this point is not lacking already, as for instance :—

(1) I think such a boundary occurs north of Sheffield, between the Loxley and Ewden valleys. The Survey hereabouts record the dying away of the 3rd (Rivelin) Grit, and great complexity in the beds underlying the Rough Rock (*Mem. Yorks. Coalfield,* pp. 38-42). There is a change in the fauna somewhere about the same area. To the south and west the marine band at the top of K (as in Strine's Dike) gives '*bilingue*' associated with the late mutation of '*spirale*'—indicating a late period in '*bilingue*' time—and some 250 feet higher in the sequence I obtained what is probably '*beyrichianum*' in abundance in a marine band at Callow Hill, north of Hathersage.

In the eastern part of the Ewden valley, on the other hand, the two marine bands seen in the shales, the lower in the Broomhead reservoir trench, and the other in Raynor Clough, both yield '*bilingue*' in profusion, and with no trace of '*beyrichianum.*'

I think there is probably a third marine band here, capping the Grit of White Lee Moor, but I have only seen a solitary fragment of clay shale from this latter horizon, and this contained no fauna.

(2) *See* complexity of K. Grit beds between the Ewden valley and the Colne (*Mem. Yorks. Coalfields,* p. 47).

(3) The oncoming of Rock 'A' of the Survey (and its cap the Upper Meltham Coal), associated as they are with an absence of good datum lines in the beds below, causes one to suspect that between Marsden and Holmfirth there may possibly be another boundary line between confluent deltas. The Marsden area would repay much further work.

(4) The complexity and variation in the beds coming down fron Oxenhope Moors (*Mem. Yorks. Coalfield,* p. 543) indicate again a boundary between contiguous deltas; the one on the south (Halifax area) being probably much later than that on the north.

(5) The wide expanse of beds of relatively uniform age north of the Wharfe ('*beyrichianum*' and ? later) appears to suggest that the whole of this area is a unit; though there are undeniably '*bilingue*' beds at Otley (Wilson, *P. Y.G.S.*, 1909, p. 83).

With regard to the vexed question of the Kinderscout Grit. There is no living man who has such a wide knowledge of the Grit stratigraphy as had Dakyns, and I think we must attach due weight to the fact that he had no doubt that the K. Grit was a definite tangible coarse bed (*see P. Y.G.S.*, 1891, p. 354)

recognisable as such in disconnected exposures. His view is, I believe, strengthened by Dr. Hind's researches in Lancashire and Derbyshire. At the same time I would observe that in every area where it can be traced eastwards from the Pennine anticline, it is seen to diminish in thickness and become rapidly finer in grain. I think it reasonable under these circumstances to retain the name of Kinderscout Grit, but localise it by terming it the *Grit of the Kinderscout Channel.*

I conceive of this grit as a plug of coarse material of '*bilingue-beyrichianum*' age filling up earlier estuarine channels, and running more or less in the direction and along the crest of the present Pennine anticlinal. The eastern boundary of this channel seems fairly definite, but of its western boundary I know nothing.

It is evident that the cause of the expansion of this and other beds in the Pendle 'Sink' needs careful investigation. (I apply the term Pendle Sink to that area around Pendle Hill where the thickness of beds becomes unusually great, and where depression must have been correspondingly acute).

The extent to which marine bands in this early portion of the detrital phase of the Carboniferous period, over-rode local boundaries and formed widespreading datum lines requires much further investigation before anything definite can be stated.

So far as is known, it is not until we get to the '*listeri* shales underlying the Rough Rock that we come to definite evidence of widespread extension of uniform deposits. Locally in the north, there is the unusual and extensive fossiliferous deposit known as the Cayton Gill beds, but these are not recognisable as such south of the Wharfe, and if represented by some marine band, the change of phase must be most marked.

This study is only in its nascent stage, and further speculation without renewed fieldwork would be unprofitable; but we may perhaps summarise the above tentative conclusions as under:—

TEMPORARY WORKING HYPOTHESES.

(1) That a very early small delta (or group of deltæ) was formed in the area between Holmforth and the Ewden valley (and possibly also near Otley) of *reticulatum* and '*bilingue*' age.

(2) Subsequent uplifts took place with resulting channels in the western side of the above area.

(3) Renewed subsidence occurred, with silting up of the above channels by plugs of coarse grit in '*bilingue-beyrichianum*' time [K. Grit].

(4) A succession of alternating coarse and fine beds of '*beyrichianum*' age formed widespreading sheets north

of the Wharfe and down the western side of the Pennine axis. Possibly some of the earlier deltas were dry land at this period.

(5) A big thickness of beds of late '*beyrichianum*' to '*listeri*' age was accumulated in the Halifax area.

(6) Fairly deep and widespread subsidence resulted in the formation of the '*listeri*' shales underlying the Rough Rock.

The cause of the formation of marine bands, their change of phase and association with coal seams, forms a most interesting study, which I propose briefly to survey in a second paper. There is at least one parallel case in Yorkshire of very recent geological date.

Without the work and stimulus of Dr. Wheelton Hind, both in the field and in the identification of the fauna, this paper would not have been possible. The debt of Yorkshire geologists to him is a perennial one.

I must also thank several members of the Yorkshire Geological Society (especially Mr. J. Holmes) for assistance in the field; Mr. A. G. Beaumont, who first drew my attention to the marine band in the Broomhead reservoir trench, and Mr. C. Clegg, engineer-in-charge, for permission and assistance in examination of the tips.

For the conclusions the writer is solely responsible.

——: o :——

Minerals and the Microscope : an Introduction to the Study of Petrology. By **H. G. Smith.** London : T. Murby & Co., 124 pp., 3s. 6d. net. The author is familiar with the requirements of the beginner in petrology and has written a book that will particularly appeal to the student. The various descriptions are clearly written and the numerous diagrams and excellent reproductions of mineral sections are all that can be desired. The volume is quite distinct from Harker's and other well-known works. Newton's scale of colours appears as frontispiece.

The British Coal Industry by **Gilbert Stone.** London : J. M. Dent & Sons, 188 pp., 3/6 net. All through this book we do not seem to be able to get away from the fact that the author is a 'Barrister-at-Law,' and that he has had to do with the Controller's Advisory Board. His essay is on 'production' and in order to review this in its various aspects an attempt is made to give a history of the coal industry, a description of the methods of gaining coal, and so on, so that by the time we get to 'The Export Trade,' 'Wages and Disputes,' etc., we have almost lost the thread of the theme. The author begins by stating that 'Aristotle once ventured the opinion that things with which the political science is conversant possess so great an ambiguity that we must be satisfied if we can indicate the truth by a rude adumbration and if our conclusions are similar in accuracy to the things themselves.' And again (p. 57) we are told 'Immediately the pre-arranged limits of the shaft bottom have been reached the miner begins to cut into the coal seam which exists throughout the area forming the pit bottom, but is there left intact as we have said.' These seem alright when thought over—but the feeling that we are going to meet with 'And whereas' at every turn makes this useful book a little difficult to follow.

THE SPIDERS OF YORKSHIRE.

WM. FALCONER, F.E.S.
Slaithwaite, Huddersfield.

(*Continued from p. 24*).

Gen. *Micryphantes* C. L. Koch, 4-6.
[Gen. *Microneta* Menge ad part.]

M. rurestris C. L. Loch.

Very widely distributed, British Isles, Europe, Siberia, N. Africa and the Azores; usually common amongst herbage. *Adult*, autumn to spring. First occurrence—the author, Slaithwaite, March, 1898.

V.C. 61, 62.—Very widespread, and recorded stations very numerous, especially in the former.

V.C. 63.—Calverley, S.M.; Bingley Woods and Harden, W.P.W.; thinly but widely diffused around Huddersfield, Slaithwaite, Marsden, Scammonden, Holmfirth, Honley, Meltham, Farnley Tyas, Saddleworth, Stocksmoor, Mirfield; Dunford Bridge; Deffer Wood; Askern.

V.C. 64.—Ilkley, W.R.B.; Saltaire Park, W.P.W.; Bolton Woods; Leeds; Scarcroft Hill (Thorner); Moor Allerton; Adel Moor; Stubbing Moor; Linton Common; Compton Bank Top.

V.C. 65.—How Gill, W.P.W.

M. gulosus Koch (*M. sublimis* Camb.)

A northern and mountain form in Great Britain; Cheviots, Helvellyn, Scafell, hills of Lanarkshire, Grampians, Snowdon; usually plentiful where found; among moss, herbage and beneath stones. *Adult* males have been taken from April to November. First occurrence—the author, Standedge, Oct., 1900.

V.C. 62.—Middlesbrough and Lonsdale, rare, J.W.H.; Ravenscar, 1♂, 1♀.

V.C. 63.—Plentiful on the moors, Standedge, Drop Clough, Outlane, Wholestone Moor, Blackmoorfoot, Crosland Moor (especially so); Chew Valley (Greenfield).

M. saxatilis Bl.

Widely distributed in Great Britain, apparently rare in Ireland, and not yet noticed on the Continent; amongst herbage; commoner in some places than in others. *Adult* ♂ May to July; ♀s most months of the year. First occurrence—the author, Slaithwaite, May, 1898.

V.C. 61.—Hornsea Mere, Bielsbeck, Houghton Woods, Springhead and Endyke Lane (Hull), Pulfin Bog, Swine Woods, Boynton Woods, Houghton Woods, S. Cave, Snake Hall Moor, Weedley Springs, Meaux, T.S.; Kelsey Hill, E.A.P., T.S.; Skipwith Common.

V.C. 62.—Scarborough, S.M.; Eston, Normanby Intake, Turkey Nab, Farndale, J.W.H.; Ringingkeld Bog R.A.T.; Goathland, Marske, Lazenby.

V.C. 63, 64.—Widely distributed and recorded stations numerous; in several Huddersfield localities plentiful.

M. beatus Camb.

When discovered near Leeds in the autumn of 1900, new to science ('Proc. Dors. F. Club, 1906'); since noted for Dorset, Surrey, Sussex, Essex, Durham, Cumberland and Northumberland; amongst fallen leaves and herbage. *Adult* June and July. First occurrence—the author, Roundhay Park, 1900.

V.C. 62.—Eston Moor, 1♀, J.W.H.; Riftswood (Saltburn), 1♂.

V.C. 63.—Deffer Wood (Cawthorn).

V.C. 64.—Grassington and Meanwood, W.P.W.; Rigton Bank. Roundhay Park (Leeds); near Scotland Mill (Adel); Bolton Woods,

Gen. *Agyneta* Hull, 4-5.
[Gen. *Micronet*a Menge ad part.]*

A. conigera Camb.
Widespread in Great Britain as far north as the Grampians, apparently rare in Ireland; in many places common; abroad, France, Bavaria and Hungary; amongst moss and herbage, and on the trunks and branches of trees. *Adult* ♂ May to July, ♀s later also. First occurrence—the author, Slaithwaite, June, 1898.
V.C. 61.—Bentley Woods, 1♂, E.A.P.; Saltend Common, females; Cans Dale, N. Burton, ♀, Birkhill Wood (Cottingham), ♂, T.S.; Skipwith Common, 1♀, W.P.W.
V.C. 62.—Wilton Wood, and Lonsdale, J.W.H.; Langdale End and Raincliff Woods, R.A.T.; Scalby, 1♀; Hayburn Wyke, ♀; Levisham, 2♀s; Boulby, 1♀; Eston Moor, ♀.
V.C. 63.—Woods at Shipley, Harden, Cottingley, and St. Ives (Bingley), W.P.W.; Saltaire Seven Arches, J.A.B. Many localities about Slaithwaite, Dean Head, Marsden, Meltham, Honley, Huddersfield, Holmfirth, Almondbury, Woodsome; Hebden Bridge, Hardcastle Crags and Crimsworth Dene; Deffer Wood (Cawthorn); Dunford Bridge.
V.C. 64.—Howden Ghyll, R.B., W.P.W.; Y.N.U., Malham, Knaresborough; Adel Moor; Dalton Lane; Newby Cote.
V.C. 65.—How Gill, W.P.W.; Cotter Force.

A. cauta Camb.
Recorded for Glamorgan, Staffs., Cheshire, Cumberland, Northumberland; Rothiemurchus, Rannock and Forres in Scotland; amongst moss and herbage often in high exposed situations, especially in damp places. *Adult* ♂ May to July; ♀s later on also. First occurrence—the author, Stubbing Moor, June, 1903.
V.C. 62.—Lonsdale, 2♀s, Gt. Ayton Moor, J.W.H.
V.C. 63.—Drop Clough; Wessenden Valley; Standedge; Chew Valley (Greenfield); Isle of Sky, Crosland Moor and Pennyspring Wood (Huddersfield), but not usually in quantity.
V.C. 64.—Howden Ghyll and Morton Moor, W.P.W.; Ingleborough; Arncliffe, 1♀; Clapham, 2♀s; Stubbing Moor; Chandler's Whin, York.

A. decora Camb.
Owing to its having been confounded with others, its distributional range is imperfectly known; it has occurred in Dorset, Cheshire, Lancashire, Northumberland, Cumberland, Inverness-shire and Ireland; amongst moss and grass generally in fields and moors, occasionally in woods. Season as in the last. First occurrence—the author, Standedge, July, 1901.
V.C. 61.—Saltend Common, 1♀, T.S.; Riccall Common.
V.C. 62.—Gt. Ayton Moor, J.W.H.; Marske, beneath furze near fox covert.
V.C. 63.—Ainley Place (Slaithwaite); Dean Head; Slaithwaite Moor; Cupwith; Drop Clough; near the Scout, Marsden; Isle of Sky; Standedge; Chew Valley.

A. subtilis Camb.†
Recorded from Dorset, Devon, Glamorgan, Derbyshire, Cheshire, Northumberland, Rothiemurchus (Scotland), Co. Carlow and W.

---

* The examples recorded under this name from Lonsdale in the 'Spiders of Middlesbrough,' J. W. Harrison were *A. cauta* Cb.-Hull.

† *Vide* Dr. Jackson's Revision of Micronetae in 'Trans. N. H. Soc. of Northumberland, Durham and Newcastle-upon-Tyne,' Vol. IV., 1912. As in the *Porrhommata*, allied species of *Agyneta* have been confounded in the past.

Kerry; abroad, France, but very rare; moss in woods, fields. especially damp places in woods.

V.C. 64.—Chandler's Whin, York, 2♀s, June, 1912; confirmed by Dr. Jackson.

Gen. *Sintula* Sim., 1-1.

S. cornigera Bl.

Rare, recorded from Dorset, N. Wales, Staffs., Cheshire, Durham, Northumberland, Grange-over-Sands; Rannock and Forres in Scotland; abroad, Norway, France, Switzerland, Italy and Hungary; amongst herbage and dead leaves in woods. *Adult*, throughout the year, chiefly autumn. First occurrence—the author, Roundhay Park, April, 1906.

V.C. 62.—Ringingkeld Bog, 3♀s, R.A.T.; Farndale, 2♀s, J.W.H.; Kilton Woods, 1♀.

V.C. 63.—Bingley Woods, 1♀, R.B., W.P.W.; Scout Wood (Slaithwaite) 1♂; Royal Clough (Pole Moor), 1♂; Lower Stones Wood (Stocksmoor), 1♂; Hey Wood (Honley), 3♀s; Hebden Bridge, in Shackleton Wood, 7♀s.

V.C. 64.—Roundhay Park, Leeds, 1♂; Sawley High Moor, 1♂, 9♀s.

Gen. *Rhabdoria* Hull. 1-1.

[Gen. *Sintula* Sim. ad part.]

R. diluta Camb.

Recorded from several widely separated English counties, the Pentland Hills and Rothiemurchus in Scotland and Ireland; commoner in some places than in others; abroad, France; among fallen leaves, moss, and at roots of herbage. *Adult*, autumn to spring. First occurrence—the author, Drop Clough, March, 1900.

V.C. 61.—Bentley Woods, E.A.P.; Birkhill Wood, Houghton Woods, both sexes, few, Brantingham Dale, T.S.; Scampston; Skipwith Common.

V.C. 62.—Wilton, Normanby Intake, Guisborough, Eston and Gt. Ayton, "not uncommon," J.W.H.; Ringingkeld Bog, R.A.T.

V.C. 63.—Calverley, S.M.; Morley and Further Hurst Wood (Shipley), W.P.W.; Beckfoot (Bingley), R.B.; Y.N.U. Cawthorn (Deffer Wood); Y.N.U., Maltby; Crimsworth Dene, W.P.W., W.F.; Hebden Bridge. Common in a wide area around Huddersfield, Slaithwaite, Scammonden, Meltham, Marsden, Greenfield, Holmfirth, Honley, Shepley, Brockholes, Stocksmoor, Woodsome, Farnley, Lepton, Ripponden.

V.C. 64.—Howden Ghyll, W.P.W.; Sawley High Moor, S.M., W.F.; Adel Moor and dam; Rigton (E. Keswick); Clapham.

Gen. *Syedra* Sim., 2-2.

S. pholcommoides Camb. (*Sintula pholcommoides* Camb.) Very rare; Dorset, Surrey and Northumberland; abroad, Germany, Austria and Hungary. *Adult* summer and autumn; among moss, grass and fallen leaves.

V.C. 62.—Carnelian Bay, 1♀, from grass roots on cliffs, Aug., 1905.

S. innotabilis Camb. (*Microneta innotabilis* Camb.)

Rare but recorded from Dorset, Hants., Surrey, Herts., Staffs., Cheshire, Northumberland, Edinburgh, Grampians and three Leinster localities. *Adult* ♂ June to August, ♀ throughout the year; amongst moss and dead leaves.

V.C. 62.—Wood between Riftswood and Skelton (Saltburn), 1♂, on trunk of larch, Aug., 1909, and 1♀ beneath the bark, Aug., 1910.

V.C. 64.—Grass Woods, Grassington, 1♂ from herbage, June, 1911.

Gen. *Bathyphantes* Menge., 8-8.

B. concolor Wid.

Widely distributed in the British Isles (including St. Kilda), and on the Continent; also N. America; common beneath débris and stones, and amongst herbage and fallen leaves. *Adult* throughout the year. First occurrence—the author, Slaithwaite, June, 1898.

In V.C. 61, 62, 63, 64.—Widely diffused and recorded stations numerous.

V.C. 65.—How Gill, W.P.W.; Upper Teesdale; Semmerdale.

B. approximatus Camb.

Noted for various localities as far north as Edinburgh, and all the Irish provinces; abroad, France, Bavaria, Hungary and Siberia; in boggy ground. *Adult* throughout the year. First occurrence—T. Stainforth, Weedley, May, 1908.

V.C. 61.—Widely diffused except in the dry dune area, and in some of the localities common.

V.C. 62.—Eston, not uncommon, Leven Bridge, J.W.H.; Raincliff, one ♂, R.A.T.; Castle Howard, J.F.

V.C. 63.—Beckfoot (Bingley), R.B., W.P.W.; Aire banks at Shipley and Ryeloaf, Cottingley Wood, W.P.W.; Loversal, H.V.C.; Deffer Wood (Cawthorn); Drop Clough (Marsden), Ainley Place (Slaithwaite), rare in these two localities; Shackleton's Mill (Hebden Bridge).

V.C. 64.—Bishop Wood, T.S.; Y.N.U. Harewood; Adel Bog; Askham Bog.

B. pullatus Camb.

Infrequent, though reported from nine widely separated English counties, Loch Shiel (Scotland), and Ireland; abroad, Sweden, France, Italy and Central Europe; partial to, but not confined to, boggy ground. *Adult* May to July. First occurrence—the author, Scampston, August, 1906.

V.C. 61.—Sutton Drain, Thorngumbald, Withernsea, Bridlington, adult males, Humber Bank, East of George V. Dock (Hull), ♂, ♀, T.S.; Kelsey Hill, ♀s, E.A.P.; River bank above Selby, Riccall and Skipwith Commons, both sexes, W.P.W., W.F.; Scampston, one ♀.

V.C. 62.—Eston and Great Ayton Moors, both sexes, J.W.H.

V.C. 64.—Chandler's Whin and Askham Bog.

B. parvulus Westr.

Very similar to, and often perhaps confounded with, the next species, but much scarcer and less generally distributed; noted for Dorset, Glamorgan, Lancashire, Cumberland, Cambs., Staffs., Lincolnshire, Northumberland, Edinburgh and three Irish localities; abroad, N. France, Sweden, Russia and N. Italy; amongst herbage in both dry and moist situations. *Adult* May to September. First occurrence—the author, Drop Clough, September, 1900.

V.C. 61.—Bridlington, King's Mill Marsh (Driffield), Boynton Woods and Welwick, T.S.; River bank above Selby, and Riccall Common, ♂s; Humber bank, near Skeffling.

V.C. 62.—Redcar, Eston, Great Hograh and Westerdale, J.W.H.; Lazenby, 1♀, and Marske, both sexes.

V.C. 63.—Bradford, G.H.O. (V.C.H.); Bingley Woods and Hurst Wood (Shipley), Harden Clough (Meltham), W.P.W.; Crimsworth Dene, W.P.W., W.F.; Hebden Bridge; Drop Clough and Wessenden Valley, Marsden; Cupwith; near Pole Moor.

V.C. 64.—Harewood Park, one ♀, W.P.W.; Linton Common, both sexes.

(To be continued).

ON A BORING AT KILNSEA, HOLDERNESS.*

G. W. LAMPLUGH, F.R.S., F.G.S.

ONE-INCH Ord. Map (N.S.), Sheet 81.82. One-inch Geological Map (Old Series), Sheet 85.

The boring was made for the War Office in 1916-17 to obtain water, but the results were disappointing. The site is ⅓ mile N.E. of Kilnsea Church, at 25 ft. above O.D., on the neck of land between the Humber and the open sea.

The boring has two features of particular interest: (1) it is the deepest yet made in Holderness; and (2) it is at the most easterly place that a boring could be put down on land north of the Humber. The depth attained was 1,001 ft., and the only other boring in Holderness approaching this depth was one made at Hornsea in 1862-4, which is stated to have gone to 978 ft. in chalk and to have ended in 'black warp or clay,'† but the record is unsatisfactory.

The log of the Kilnsea Boring, as supplied to us, is as follows :—

	Thickness, ft.	Depth, ft.
Red marly clay	10	10
Blue ,, ,, ...	51	61
Silt	2	63
Boulder clay	64	127
Silt	3	130
Chalk	40	170
Soft chalk	468	638
Hard chalk without flints	363	1,001

Brackish water met with up to 800 ft. No water at 900 ft. Brackish water at 1,000 ft., and 3½ gallons per hour in quantity.

A set of specimens was sent for our inspection when the boring was finished, and those from the drift yielded a little further information, as set forth below, but those from the Chalk (at intervals of every 25 ft. or so) had all been pugged into the condition of whiting and showed hardly any difference from top to bottom. A search was made for chips of flint, but none was found, which leads to the conclusion that the Chalk with Flints was not reached, and that the Chalk without Flints may be more than 850 ft. thick in this part of Holderness. At Flamborough Head the Chalk with Flints, the Lower Chalk, and the Red Chalk, together, have a thickness of about 620 ft.,‡ so that if this thickness is continued under

* Reprinted, by permission of the Controller of His Majesty's Stationery Office, from the *Summary of Progress of the Geological Survey for* 1918, pages 63 to 64.

† 'The Water Supply of the East Riding of Yorkshire,' *Mem. Geol. Survey*, 1906, p. 106.

‡ For notes on the thickness of the chalk in Yorkshire *see* Lamplugh. *Proc. Yorks. Geol.* and *Polytech. Soc.* N.S., vol. xiii (1895), p. 75.

Holderness, the whole Chalk formation is likely to be not less than 1,500 ft. thick in the neighbourhood of Spurn Point.

The following are our observations on the specimens :—

From depth of— Ft.	
10	Weathered reddish boulder-clay (resembling 'Hessle-clay' of cliff-sections).
25	Purple boulder-clay, containing many fragments of chalk.
61	Purple-brown boulder-clay, with crumbs of chalk.
63	,, ,, rather sandy, with a 1½ in. pebble of chalk.
88 and 102 ...	Firm rather sandy darkish purple boulder-clay, with crumbs of chalk; (these and the preceding specimen probably represent the 'Basement Clay' of the coast section.)
122	Brownish purple boulder-clay, streaky; (probably some laminated clay pugged among it).
127	Chocolate brown silty clay; no stones.
130	Brown, laminated silty sand, with particles of mica and specks of carbonaceous matter.
137	Firm small chalk-rubble ('chalk-wash') mixed with grit; contains a ¼ in. cherty pebble; (like the 'chalk-wash' locally occurring at base of drift on Flamborough Head).
162 to 1,000...	Pugged chalk, reduced to powder-paste, smooth and gritless, with here and there a small pellet of dark grey marl (indicating occasional marl partings).

The noteworthy points respecting the drifts, so far as they are represented by the specimens, are the preponderance of boulder-clay; the lack of marked diversity in its composition; the apparent absence of interbedded sand or gravel which is usually abundant in the Holderness cliff-sections; and the presence of fine chalky rubble between the Chalk and the drift. This Chalk-rubble is recorded as part of the Chalk in the log of the boring, but the specimen from the depth of 137 ft. was unmistakably a gritty rubble or 'Chalk-wash,' and not the solid Chalk. As to the thickness of this deposit, the only evidence is that the depth assigned to the specimen is seven ft. below the supposed top of the 'Chalk,' and that the next specimen, from a depth of 162 ft., is pulverised Chalk evidently representing the solid rock. The thickness of the rubble is therefore more than 7 ft. and less than 32 ft., but no closer approximation is practicable. A similar rubble exposed in the cliff and foreshore at Sewerby, on the south side of Flamborough Head, was found to contain small land-shells, indicating that it had been accumulated on a land-surface.* The presence of similar material at Kilnsea at

* Lamplugh. *Proc. Yorks. Geol. and Polytech. Soc.* N.S. vol. xv. (1903), pp. 91-5.

over 100 ft. below sea-level suggests a minimum measure for the elevation of the land above sea level in East Yorkshire prior to the glaciation. The laminated clay and sand between the chalk-rubble and the boulder-clay recalls the presence of similar deposits in the same position in some of the drift-filled valleys of Flamborough Head, *e.g.*, that known as Dane's Dyke. The supposed Interglacial Shelly Gravels of Kelsey Hill and other places in the interior of Holderness appear to have no representative in the section.

——: o :——

Interesting papers on the Merlin and Oyster-catcher appear in *British Birds* for January.

We notice that the price of *The Entomologist's Monthly Magazine* has again been increased, and in future will be 2s. a part, or 15s. per annum.

In connexion with early records of the Lady's Slipper Orchid, one from a work dated 1731, was given in *The Naturalist* for November, 1914, p. 349, where the species was recorded ' at the end of Helkeswood near Ingleborough.'

In *British Birds* for December is an interesting record of a Swallow picked up in South Africa on February 21st, 1919. It had a ring on its leg, which was placed there when the bird was a nestling, at Low, Bentham, Yorkshire, on August 19th, 1918.

We learn from *Nature* that ' Mrs. Osbourn, the wife of the President of the American Museum of Natural History, has presented a striking portrait of her husband to the Sedgwick Museum. It is proposed to hang this portrait among the fossil mammals.'

The Geological Magazine No. 665 contains papers on The Magnesian Limestone of Durham, by Dr. D. Woolacott, and The Occurrence of *Productus humerosus* in Dove Dale, by Mr. J. W. Jackson ; and in No. 666, Mr. W. A. Richardson writes on ' The Origin of Cretaceous Flint.'

In No. 666 of *The Geological Magazine* for December, 1919, the editor opines that ' Geology has now become a science of the widest practical importance in all parts of the world.' Oddly enough, a somewhat similar sentiment appears in the editor's note in No. 1 of the same journal, issued in July, 1864.

An excellent report of the Annual Meeting of the Entomological Section of the Yorkshire Naturalists' Union appears in the *Entomologist's Monthly Magazine* for January. The same journal contains a fine portrait of the late Lord Walsingham, and we are informed that a Memoir, *with portrait*, will appear in the February issue.

We don't know whether our Entomological contemporaries are vieing with each other as regards editors, but we notice Messrs. W. G. Sheldon and N. D. Riley have just been added to the editorial staff of *The Entomologist*, thus bringing up the total to eleven, the same as that of *The Entomologist's Record*. Perhaps each editor becomes a subscriber ?

Among the contents of No. 87 of *The Minerological Magazine* we notice A Students' Goniometer, by G. F. H. Smith, several obituaries, and L. J. Spencer's Eighth list of new mineral names. This includes such items as Zebedassite, Strontiohitchcockite, Psilomelanite, Magnesio-ludwigite, Högbomite and others, which might possibly be of service to second-lieutenants and bargees, should special cases arise when their ordinary vocabulary fails them.

ON THE OCCURRENCE OF *ARION ATER* LINNÉ IN EAST ICELAND.

HANS SCHLESCH.

Arion ater Linné has previously been recorded from S.W. Iceland* only, though N. Mohr† records the species as 'not common in the East.' As it had not been found there for more than a hundred years the record was thought to be an error. For this reason, therefore, it was a great pleasure to me, on the 30th June, 1919, to find several specimens ‡ on the road between Seydisfjördur and Vestdalseyri; and since I have noticed the species in several of the other fjords (Lodmundar fjord, Mjoifjord, Nordfjord) and believe that it will be found generally distributed along the East coast. It is interesting to note that the ecological conditions for this species in Iceland are quite different from those of the Continent.

——: o :——

According to the *Times* of December 27th, a pine marten was said to have been seen at the foot of Honister pass, 'a few days ago.'

The death is announced of J. Hartley Wicksteed, one of the first members of Council of the Yorkshire College, afterwards becoming a life governor of the Leeds University.

We are glad to see that there have been letters of protest against the well-meaning persons who have drawn attention in the press to the localities where kingfishers and other rare birds can be seen.

Another *Punch* joke. 'According to a Naturalist journal a most unusual number of frogs has invaded gardens and orchards during the latter part of this month. This, we hear, is a recognised sign of the approach of Leap Year.' *We* see it!

The London Natural History Society this year does not mix up the advertisements with the text—indeed separates them by a blank page; but, as the pages of advertisements are numbered consecutively with the Transactions proper, it will still be difficult to omit the advertisements when binding the volume.

The *Hull Museum* continues to issue its *Quarterly Records*, and the following have just been published:—No. 117—Anglo-Saxon Remains found in East Yorkshire ('our German Ancestors'); No. 118—The Stather Collection of Lepidoptera; No. 119—A List of Yorkshire Medals; No. 120—Quarterly Record of Additions; No. 121—Whaling Relics. All these, with the exception of No. 118, which is by Mr. T. Stainforth, have been written by the Curator, Mr. T. Sheppard. As showing the variety of the material dealt with, No. 120 contains the following illustrated notes:—'Hull Silver Tankard; Rare Yorkshire Tokens; Early German Relics in Lincolnshire; Bones of Bear from York; Assize of Bread; Money Scales and Weights; Spring-gun enclosed in Oak Tree,' by Mr. Sheppard. 'Coins as Media for Workmen's Marks,' by Mr. J. F. Musham, and 'Fossils of the Holderness Basement Clays,' by Mr. Alfred Bell.

---

* *The Naturalist*, 1917, p. 299.

† N. Mohr, Forsög Ail en islandsk Naturhistorie, Köbenhavn, 1786.

‡ To be seen in my collection in the Hull Museum.

BIBLIOGRAPHY :

Papers and Records relating to the Geology and Palaeontology of the North of England (Yorkshire excepted*), published during 1919.

T. SHEPPARD, M.SC., F.G.S.

1918.

F. N. SIDDALL. Lancashire S.

Instantaneous Outburst of Coal and Gas at Bedford Collieries, Leigh. *Trans. Manchester Geological and Mineral Society,* Vol. XXXV., pt. x., pp. 318-327.

[T. W. D. SMITH, Editor]. Northern Counties.

The Magnet of Commerce. Interesting Information and Useful Statistics relating to Coal, By-Products of Coal, Engineering, Electricity, Textiles, Timber and other Industries, pp. 174+cxxxvi.

A. STRAHAN. Northern Counties.

Special Reports on the Mineral Resources of Great Britain, Vol. VII.; Lignites, Jets, Kimmeridge Oil-Shale, Mineral Oil, Cannel Coals, Natural Gas. Part I., England and Wales. *Mem. Geol. Survey,* 69 pp. Reviewed in *Geol. Mag.*, May, 1919, pp. 231-232.

1919.

ANON. Durham, Yorkshire.

Durham Glacial Beds. Loess : a Yorkshire Comparison [notice of C. T. Trechmann's paper]. *The Naturalist,* February, pp. 54-55.

ANON. Lancashire, Yorkshire.

Carboniferous of Clitheroe. Goniatite Zones. *The Naturalist,* February, p. 56.

ANON. Cumberland.

'Rock-Riders' in Cumberland. Sandstone Dykes. Age of Dykes [notice of A. Gilligan's paper]. *The Naturalist,* February, pp. 53-54.

ANON. Lancashire S.

A New Carboniferous Nautiloid [*Coelonautilus trapezoidalis* ; notice of J. Wilfrid Jackson's paper]. *Lancashire and Cheshire Naturalist,* December, 1918 [published March, 1919], p. 248.

ANON. Nottinghamshire, Derbyshire.

British Petroleum. *Nature,* June, 19, pp. 306-307.

ANON. Northern Counties.

Coal and its Scientific Uses [notice of volume by W. A. Bone]. *The Naturalist,* July, p. 218.

ANON. Northern Counties.

Yorkshire Shelly Drift : A well armed Glacialist : Anchor Ice [notice of discussion on paper by F. Debenham]. *The Naturalist,* July, pp. 222-224.

---

*The list of Yorkshire items is printed in the 'Proceedings of the Yorkshire Geological Society.'

ANON. Northern Counties.

British Quarries during the War [notice of F. H. Hatch's book]. *Quarry*, September, pp. 235-238.

ANON. Northern Counties.

Sands : Iron Ores : Lincolnshire Ores [review of P. G. H. Boswell's pamphlet]. *The Naturalist*, October, pp. 316-317.

ANON. Lincolnshire, Yorkshire.

The Drake Collection : The Bower Collection. *The Naturalist*, October, pp. 317-318.

ANON. Lake District.

The Green Slate Industry of Lakeland. *Quarry*, October, pp. 278-279.

ANON. Derbyshire, Durham.

'Blue John' [notice of paper by B. Blount and J. H. Sequeira]. *The Naturalist*, November, pp. 348-9.

ANON. Northern Counties.

North of England Borings [notice of J. W. Evans's address]. *The Naturalist*, November, pp. 350-2

ANON. Lincolnshire, Yorkshire.

Hull Museum : Additions to Geological Collections [Drake and Bower Collections]. *Museums Journal*, October, pp. 66-67. *Geol. Mag.*, November, pp. 482-483. *The Naturalist*, October, pp. 317-318.

ANON. Northern Counties.

Quarries Statistics in 1918. Inspection Reports. II.—Northern Division. III.—York and North Midland Division. *Quarry*, November, pp. 293-295. **IV.—Lancashire, North Wales and Ireland.** *Quarry*, December, p. 322.

ANON. Cheviots.

The Cheviots [notice of J. J. H. Teall's paper]. *The Naturalist*, December, p. 377.

W. E. ATKINS. See J. WILFRID JACKSON.

J. B. ATKINSON and J. T. STOBBS. Northern Counties.

The Geology of the Refractory Materials of the North of England [abstract]. *Quarry*, July, pp. 181-185.

ALFRED BELL. Isle of Man.

Fossil Shells from Wexford and Manxland. *Irish Naturalist*, October, pp. 109-114.

BERTRAM BLOUNT and JAMES HARRY SEQUIERA. Derby., Durham.

'Blue John' and other forms of Fluorite. *Trans. Chemical Society*, Vol. CXV., pp. 705-709. See also *The Naturalist*, November, pp. 348-349. *Nature*, September 18, p. 65.

EDITH BOLTON. Lancashire, Yorkshire.

Lower Coal Measures in Relation to Fossil Plants and Animals. *Ann. Rep. and Proc. Bristol Nat. Soc.*, N.S. Vol. V., pt. 1., pp.30-38.

W. A. BONE. See ANON.

P. G. H. Boswell. Northern Counties.

Sands ; considered geologically and industrially, under war conditions. Liverpool, 38 pp. *See The Naturalist,* October, pp. 316-317.

P. G. H. Boswell. Derby., Notts., Yorks.

The Geology of Sands and Aggregates for Concrete Making. With especial reference to Texture. Paper read to *The Concrete Institute,* London, 22 pp. Abs. in *Quarry,* pp. 242-246.

P. G. H. Boswell. Notts., Lancs., Yorks.

Ferruginous and other Bonds in Molding Sands. Paper read to the *American Foundrymen's Association,* Milwaukee, in October, 1918, 12 pp.

P. G. H. Boswell. Nottinghamshire.

A Comparison of British and American Moulding-Sand Practice [Paper read at *British Foundrymen's Association,* Liverpool, July], 18 pp.

Hilda K. Brade-Birks. See J. Wilfrid Jackson,

S. Graham Brade-Birks. See J. Wilfrid Jackson.

Sydney Brooks. Northumberland, Durham.

Some Problems of Coal. *Nineteenth Century and After.* March, pp. 465-474.

Albert F. Calvert. Cheshire.

Salt and the Salt Industry. London, pp. vii. + 151. Reviewed in *Nature,* January 15th, pp. 497-498.

A. Campbell. See E. H. Cunningham-Craig.

T. C. Cantrill, R. L. Sherlock, Henry Dewey. N. Counties.

Special Reports on the Mineral Resources of Great Britain, Vol. IX., Iron Ores (continued): **Sundry Unbedded Ores of Durham, East Cumberland, North Wales, Derbyshire, the Isle of Man, Bristol District and Somerset, Devon and Cornwall.** *Mem. Geol. Survey,* pp. iv.+87. Review in *Nature,* January, 1920, pp. 429-431.

G. A. J. Cole. Northern Counties.

Aids in Practical Geology, 7th ed., 447 pp.

Brysson Cunningham. Northern Counties.

Sea Aggression [review of ' Coast Erosion and Protection,' by E. R. Matthews. See under 1918]. *Nature,* February, 27 pp., 505-506.

Northern Counties.

E. H. Cunningham-Craig, W. R. Ormandy, F. M. Perkin, A. Campbell, A. E. Dunstan, A. H. Seabrook.

A Treatise on British Mineral Oil, xi.+233 pp.

Charles Davidson. Derbyshire.

On the Stafford Earthquakes of January 14-15, 1916, and on the Relations between the Twin-Earthquakes of the Midland Counties. *Geol. Mag.,* August, pp. 302-312.

HENRY DEWEY. See T. C. CANTRILL.

A. E. DUNSTAN. See E. H. CUNNINGHAM-CRAIG.

J. W. EVANS. Northern Counties.

Address to the Geological Section [of the British Association]. Abstract in *Nature*, October 2, pp. 102-107; *The Naturalist*, November, pp. 350-352; *Geol. Mag.*, November, pp. 509-517, December, pp. 551-563.

ALBERT GILLIGAN. Cumberland.

On Sandstone Dykes or Rock-Riders in the Cumberland Coalfield [abstract] *Abs. Proc. Geol. Soc.*, pp. 31-36; *Geol. Mag.*, March, pp. 136-138. See also *The Naturalist*, February, pp. 53-54; *Nature*, January 30, p. 437, and *Phil. Mag.*, October, pp. 499-500.

ALBERT GILLIGAN. Northern Counties.

The Petrography of a Sedimentary Rock, with special reference to the Carboniferous System. *Trans. Inst. Min. Eng.*, Vol. LVII., Part 1, pp. 1-13; abstract in *Quarry*, March, pp. 67-69.

ALBERT GILLIGAN. Lake District, Yorkshire.

The Petrography of the Millstone Grit Series of Yorkshire. *Abs. Proc. Geol. Soc.*, No. 1040, May 31st, pp. 88-92; abstract in *Nature*, June 12th, p. 297, also *The Naturalist*, August, p. 253, and *Geol. Mag.*, August, pp. 331-334.

ALFRED [should be ALBERT] GILLIGAN. Lake Dist., Derby., Yorks.

Petrography of the Carboniferous System [abstract of paper read before the *Mid. Inst. M. and M. Eng.*, January, 30]. *Quarry*, March, pp. 67-69.

J. C. M. GIVEN. See T. A. JONES.

J. FREDERICK N. GREEN. Lake District.

The Vulcanicity of the Lake District [Presidential Address]. *Proc. Geol. Assoc.*, Vol. XXX., pt. 4, pp. 153-182.

J. F. N. GREEN. Lake District.

The Mell Fell Conglomerate. *Proc. Geol. Assoc.*, Vol. XXIX., pt. 3, pp. 117-125.

J. F. N. GREEN. Lake District.

The Skiddaw Granite: a Structural Study. *Proc. Geol. Assoc.*, Vol. XXIX, part 3, pp. 126-136.

ALFRED HARKER. Northern Counties.

Petrology for Students. Fifth ed., Cambridge, 300 pp.

F. H. HATCH. Northern Counties.

Stripping and Working Ironstone Quarries. *Quarry*, August, pp. 211-216.

F. H. HATCH. Northern Counties.

The Ministry of Munitions and its influence on the Iron and Steel Trade. *Iron and Steel Trades Review*, (i) Introduction, Vol. XCVIII., p. 873, June 27th; (ii) Basic Iron Programme, *loc. cit.*, Vol. XCIX., pp. 1-2, July 4th; (iii) Extensions to Works, Vol. XCIX., pp. 35-6, July 11th; (iv) Steel Production, Vol. CXIX.,

pp. 69-70, July 18th ; (v) Some Steel-Making Materials, Vol. CXIX, pp. 103-5, July 25th ; (vi) Hematite Ore, Vol. XCIX, pp. 133-4, August 1st.

F. H. HATCH. Durham, Lincs, Cum., Lancs., Yorks.

Recent Iron-Ore Developments in the United Kingdom [lecture delivered at the Royal School of Mines]. *Journ. Soc. Chem. Industry*, Vol. XXXVIII., No. 12, June, pp. 219R-223R ; see *Geol. Mag.*, September, pp. 387-397.

F. H. HATCH. Northern Counties.

The Iron and Steel Industry of the United Kingdom under War Conditions : a Record of the work of the Iron and Steel Production Department of the Ministry of Munitions, 167 pp. See review in *Quarry*, September, pp. 235-238 ; *The Naturalist*, November, p. 355 ; *Geol. Mag*, September, pp. 424-425.

WILLIAM HEWITT. Cheshire.

The Ancient Settlements in Wirral in relation to the Surface Geology [abstract] *Geol. Mag.*, April, p. 187 ; also *Lancs. and Cheshire Nat.*, December, 1918 [published March, 1919], p. 252.

W. HEWITT. See T. A. JONES.

G. HICKLING. Lancashire S.

The Geology of Manchester as revealed by Borings [notice of, by R. H. R. See 1918 list]. *Geol. Mag.*, February, p. 81.

WHEELTON HIND and ALBERT WILMORE. Lancs., Yorks.

The Carboniferous Succession of the Clitheroe Province, *Abs. Proc. Geol. Soc.*, pp. 18-20 ; *Geol. Mag.*, February, pp. 88-89. *The Naturalist*, February, p. 56.

F. T. HOWARD. Cheshire, Lancashire S.

The Geographical Position of Chester. *The Geographical Teacher*, No. 55, Vol. X., pt. 3, pp. 94-100.

V. C. ILLING. Derbyshire.

The Search for Subterranean ' Oil-Pools ' in the British Isles. *Geol. Mag.*, August, pp. 290-301. See also *The Naturalist*, September, p. 284.

J. W. JACKSON. Lancashire, Cheshire.

The Association of Facetted Pebbles with Glacial Deposits [notice of, see under 1918]. *Geol. Mag.*, February, p. 82

J. WILFRID JACKSON. Cheshire.

' Shell-Pockets ' on Sand-Dunes on the Wirral Coast, Cheshire ; and Notes on Ancient Land Surfaces. *Lancs. and Cheshire Nat.*, July, pp. 9-14, and August, pp. 39-44 ; abstract in *Nature*, March 6th, p. 18.

J. WILFRID JACKSON. Derbyshire.

Productus humerosus in Dove Dale. *Geol. Mag.*, August, p. 335.

(To be continued).

REVIEWS AND BOOK NOTICES.

The Clarendon Press, Oxford, has published **The Foundations of Geography in the Twentieth Century,** by **Franz Schrader,** being the first Herbertson Memorial Lecture (26 pp., 2s. 6d. net). It is an excellent address—originally given at Oxford and repeated at Liverpool, and will appeal particularly to the increasing number of students of geography. The author is fron the Ecolé d'Anthropologie at Paris, and the lecture is interesting as giving the views of a French scholar familiar with the work of Englishmen.

The Story Book of Birds and Beasts, by **J. H. Fabre.** London : Hodder & Stoughton, 315 pp., 7s. 6d. net. We feel it is only necessary to draw the attention of our readers to yet another book by M. Fabre. There are twenty-six chapters, about half dealing with birds and the other half with mammals. An idea of the scope of the book can be gathered from the first six chapters ; ' The Cock and the Hen,' ' The Gizzard,' ' The Chief kinds of Poultry,' ' The Egg,' ' Incubation,' ' The Young Chickens.' In the latter portion of the book familiar animals are described—the dog, cat, sheep, goat, ox, pig, horse and ass.

An Introduction to Anthropology by **Rev. E. O. James.** Mac-Millan & Co., 259 pp., 7s. 6d. net. The author hopes this work may be of service ' to those persons who are about to pursue a systematic course of training at the University of Oxford or London for a Diploma in Anthropology,' though we are glad we are not among them, as the narrative is by no means easy to follow, and to ' cram ' from this would be an undertaking. Throughout, also, it is so obvious that the author is a *Rev.*, that his chapters on Evolution, Antiquity of Man, etc., give one the impression, rightly or wrongly, that the views given are prejudiced ; and Mr. Moir is thanked for help, which seems to have been fairly generous, judging from the frequent references to that writer's papers and opinions. A large section of the book is devoted to a discussion on the origin and antiquity of man, on the lines of so many which have been published recently. The present version is not convincing ; for instance on a general subject such as The Ice Age, the author says : ' We feel that the general scheme of four Ice Ages separated by Interglacial phases, as suggested by James Geikie, Penck, Sollas and Bruckner, is supported by stronger evidence than the arrangement advocated by the French School—Boule, Breuil, Obermaier, etc., or that of Dawkins and Lamplugh, [!], in this country.' Such of the authorities as are living will, no doubt, be amused or annoyed at this ' grouping.' However, as the Rev. author truly says, ' the subject is really one of geology.' In dealing with the Piltdown man, the age of the remains, as given by Dawson and Smith Woodward, is quoted as ' early Pleistocene ' ; but only if their ' assumption is correct,' whereas others, who know as much about it as does Charley's Aunt, are quoted, and on the strength of their opinions the Piltdown man is put in the ' Pliocene.' The Rev. author quotes much about the notorious Ipswich skeleton, ' if it can be proved that the site is really undisturbed,' etc., but in a footnote it is stated that Mr. Moir has ' lately ' published a letter in which he gives up the claim to a great age for this skeleton. Why confuse matters by mentioning it at all? Similarly, much is said as to the significance of the absence of polished axes at Cissbury, a footnote then follows : ' A polished celt has since been discovered at Cissbury.' We know where there are dozens of polished celts from Cissbury. The types of ancient men are also a bit confusing. What is the ' Galley Hill-Piltdown type,' the ' Eoanthropus-Galley Hill-Cro-Magnon species,' the ' Piltdown-Galley Hill race,' and ' the Piltdown-Galley Hill-Cro-Magnon type.' An indication of the author's opinion of the value of his work is shown by the meagre index, in which, in some cases, only two out of eight of the actual references to a particular subject are indexed.

ADDITIONAL PLANT-GALLS FROM THE SCARBOROUGH DISTRICT.

JAMES MEIKLE BROWN, B.SC., F.L.S., F.E.S., F.C.S.

WHILE collecting in the vicinity of Scarborough during the first week of September last, some attention was paid to the distribution of the plant-galls occurring in the neighbourhood. A list of about fifty of these was prepared, but its publication was anticipated by that given by Mr. Falconer in *The Naturalist* for December last. A considerable number of species, naturally, appeared in both lists, but I have records of something like twenty forms not noted by Mr. Falconer. The following notes give these records, and some additional localities :—

HYMENOPTERA.

Andricus testaceipes Hart. Scarborough.
A. ostreus Gir. Forge Valley, Hackness.
Dryophanta agama Hart. Scarborough.
D. verrucosa Schl. form *divisa* Hart. Common about Scarborough.
Rhodites eglanteriae Hart. On wild rose, by the roadsides between Scarborough and Filey.
R. rosae L. Common and widely distributed in the district, some specimens being particularly fine.
Xestophanes brevitarsus Thoms. On *Potentilla erecta* Hampe, on the cliffs near Scalby Mills.
X. potentillae Retz. On *Potentilla repens* L., by the roadsides near Filey.

DIPTERA.

Perrisia persicariae L. Scarborough.
P. rosarum Hardy. Fairly common, Cayton Bay.
P. lathyricola Rubs. Ravenscar, Cayton Bay.
P. galii H. Low. Very plentiful on *Galium verum* L., on the cliffs between Scarborough and Filey.
P. veronicae Val. Plentiful, and widely distributed, Silpho Moor, Hackness, Filey, etc.
? *P. kiefferiana* Rubs. A gall occurred on leaves of *Epilobium angustifolium* L., which corresponds well with this species as given by Houard* ; Swanton,† however, does not mention it as occurring in this country.
Oligotrophus annulipes Hart. Common on leaves of beech, Hackness, Silpho Moor, Filey, etc. I found no signs of *Mikiola fagi* Hart., though search was made for it. Swanton‡ states that it is rare in Britain. Falconer records it for both the Bridlington § and the Scarborough districts.
Contarinia loti DeG. Common in the district, Filey, Ravenscar, Cayton Bay.
C. Steini Karsch. In woods near Cayton Bay and on Oliver's Mount, Scarborough, in both cases on the pink campion, as noted by Falconer.

---

* Les Zoocecidies des Plantes d' Europe, etc., p. 755.
† British Galls.
‡ *Loc. cit*, p. 71.
§ *The Naturalist*, December, 1918, p. 384.

1920 Feb. 1

Urophora solstitialis L. Fairly common, Scalby Mills, Cayton Bay, Silpho Moor.
Macrodiplosis dryobia F. Low. On oak, Scarborough.
Macrolabis corrugans F. Low. On *Heracleum Sphondylium* L., Cayton Bay, Hackness, Scarborough.
Rhopalomyia millefolii H. Low. Filey.
The bracken, which is plentiful in various places in the district, such as Silpho Moor, and in the Forge Valley, seemed to be free from galls produced by *Perrisia filicina* Kief., which occur so commonly where this plant flourishes.

HOMOPTERA.

Chermes abietis Kalt. Forge Valley.
Pemphigus bursarius L. Scarborough.
Aphis urticae Fabr. Roadsides, Filey.

ACARI.

Eriophyes macrorrhynchus Nal. On sycamore, Hackness.
E. thomasi Nal. Plentiful on *Thymus Serpyllum* L., Hackness.
Epitrimerus trilobus Nal. On elder, Scarborough.

FUNGI.

Taphrina aurea Fries. Scarborough.

The fungus noted by Mr. Falconer on *Poterium Sanguisorba* was also observed in quantity about Cayton Bay.

——:o:——

Plays of the Ridings, by **F. W. Moorman.** London : Elkin Matthews, 98 pp., 2s. 6d. net. This is really a sequel to the late Prof. Moorman's ' Songs of the Ridings,' recently noticed in these columns. Three excellent little plays (An All Souls' Night's Dream,' ' Potter Thompson,' and ' The Ewe Lamb ') in dialect, are given for ' the peasant or artizan actor in the hope it may do something to quicken an interest in dramatic art.' There is an excellent preface.

Wonders of Insect Life : Details of the Habits and Structure of Insects Illustrated by the Camera and the Microscope, by **J. H. Crabtree.** London : Routledge, 211 pp., 6s. net. In this work the author gives a readable account of the habits of various families of insects, and illustrates his remarks by 32 full-page photographic illustrations, containing nearly 150 figures. The photographs are very fine and care has been taken to give accurate descriptions of the habits of the insects described. It is just the book to put into the hands of an intelligent young man or woman.

The Sea Shore : its inhabitants and how to know them, by **Forster Robson.** London : Holden and Hardingham, 111 pp., 1s. 6d. net. We are not quite sure of the object of this book; if for children the first few pages will be enough for them ; if for ' grown-ups,' the matter is far too scrappy and general. For instance, ' The Common Top. The top is pyramidal in form with a flat, broad base, the opening of the shell being closed with a spiral operculum. The Grey Top is smaller and is a yellowish grey in colour with dark markings ; sometimes it is found almost white with pink markings.' The illustrations, ' by the author,' are the worst we remember having seen in a natural history book. We defy anybody to guess what the sea-urchin, heart urchin, the common top, the piddock, or the masked crab are, if shown without the descriptions.

FIELD NOTES.

BOTANY.

Selby Botanical Notes.—*Helleborine* (*Epipactis*) *latifolia.* Mr. J. B. Foggitt reports a large bed of this plant, which appears to be spreading, by the roadside bordering Skipwith Common, also a large increase in the area occupied by *Cirsium britannicum. Vicia tetrasperma* is also abundant on the side of a green lane leading off the Common. *Centaurea solstitialis* in bloom occurred to me in Selby Park in the last week of October, 1919. *Asplenium Ruta muraria* is quite established now in certain spots in and near Selby.—J. F. MUSHAM.

Inula Conyza, D.C. in Craven.—The Ploughman's Spikenard (*I. Conyza* D.C.) according to our flora, is apparently absent over the Carboniferous limestone area; it is fairly frequent on the Permian and sandy tracks further east and again to the west is common on the Carboniferous Limestone of the Carnforth District. Altitude is probably the determining factor. Watson gives 100-200 yards as a limit for England, and Lees 300 feet for West Yorks. On November 2nd, last, however, I saw a well-grown plant on limestone screes near Buck Ha' Brow, Settle, altitude about 750 feet. It may have been previously overlooked, but I have not seen a record of it for the district mentioned above.—CHRIS. A. CHEETHAM.

West Yorkshire Moss Notes.—Looking over some notes on mosses recently the following seem of sufficient interest to bring forward:—*Weisia tenuis* C.M. (*Gymn. tenue,* Schd.). This is not recorded from L. or R. drainage; it occurs in Catrigg Glen, Stainforth. Another interesting record for it is Swillington, near Leeds. *Rhabdoweisia denticulata,* B. and S., previously only recorded from Lune drainage, was found with the above near Stainforth. *Pylaisia polyantha* B. and S., plentiful on Elders and Hawthorn, near Ingleton (Park Gill). There are no previous L. records. *Bryum alpinum* Huds., in fair quantity on Stainburn Moor towards Little Almias Cliff, on a wet heath, as a rule restricted to pre-Carboniferous rocks in West Yorkshire.—CHRIS. A. CHEETHAM.

Botanical Notes.—During the autumn when water supplies were unusually low, visits were made to Fewston and Chelker reservoirs to examine the exposed mud for Bryophytes. In both places *Pleuridium axillare* Lindb. (*P. nitidum* Rabenh.) was the conspicuous moss, many square yards of dried mud being covered with a green carpet of this minute species in fruit. With it at Fewston was *Discelium nudum* Brid., easily recognised by its persistent

protonema and immature capsules. *Discelium* was noted in the Washburn valley at Farnley in 1902 by G. B. Savery, and on several occasions in Upper Nidderdale by the late R. Barnes, but it does not appear to have been previously recorded for Upper Washburn. Accompanying the *Pleuridium* at Addingham was *Physcomitrella patens* B. and S., a small earth moss previously known in Yorkshire only in the east of the county (V.C. 61 and 62). *Weisia microstoma*, var. *brachycarpa* C.M., gathered on the margin of Gormire lake, in August, is an addition to the North Riding (V.C. 62). During 1919, *Lejeunea Rossettiana* Massal. has been seen in Wharfedale at Bolton Abbey, Hartlington Gill and Buckden, and *Tortula cernua* Lindb. has been found to be in a flourishing condition in its two British stations at Conisborough and Aberford.—W. H. Burrell, 31st December, 1919.

—: o :—

ENTOMOLOGY.

Queen Wasp.—A Queen Wasp was buzzing about my house on the morning of Christmas Day, which was mild and sunny.—R. Fortune.

Abundance of Coccinella 7-punctata at Meltham.—In the vicinity of Belle Vue, Meltham (altitude 950 feet), on the 20th September last, conspicuous objects among the bordering herbage of a turnip field were the huge swarms of *Coccinella 7-punctata*, so much so that they attracted attention owing to the colour which the masses gave.—W. E. L. Wattam, Newsome.

Trichocera annulata Mg. in Yorkshire.—The winter gnats (*Trichocera*) seem to be generally neglected and might repay investigation. Verrall stated his opinion that the species required more minute study. We seem to have two species common in Yorkshire, *T. hiemalis* Deg., and *T. regelationis* L. (*The Naturalist*, 1908, p. 104).

In addition to these I took a smaller species *T. annulata* Mg. by sweeping over dry nettles, etc., near Austwick in early November last year; at a time when few insects are to be found these gnats ought to provide an interesting study.—Chris A. Cheetham.

—: o :—

BIRDS.

Rare Birds in Upper Nidderdale.—Three rare birds frequented the neighbourhood of Ramsgill in September, 1914, which I now record. They were an osprey which remained over a fortnight, frequenting the reservoir at Gouthwaite, and when last seen was flying up the river carrying a

large Grayling in its claws; a Bittern frequented the neighbourhood at the same time and was allowed to depart unmolested; and a Honey Buzzard, which was not so fortunate, as it was shot and is now preserved at Bewerley Hall.—R. FORTUNE.

'Solitary Snipe' in Yorkshire.—I wish to put on record the occurrence of a Solitary Snipe at Rievaulx (Helmsley, North Riding), on the 28th September last. My brother-in-law, Col. C. W. Duncombe, flushed the bird near his house, and was struck by its size, and deliberate flight. It lit again some fifty yards off in a small marshy patch of ground. Suspecting what it was, he went indoors for his field glasses, and though he was unable to make it out on the ground, owing to the vegetation, he was able, after it rose again at ten yards' distance, to satisfy himself. He specially noticed its dull grey flanks and under parts, and the absence of any conspicuous white in the plumage. It flew steadily, uttering no note, and dropped in a neighbouring orchard from which it could not be again induced to rise. I think there is no doubt that the bird was properly identified. Mr. J. Wormald, of Foston Hall, York, saw another specimen shot in Lanarkshire, N.B., within a few days of the above date. This bird was examined, and identified by a cousin of his, a well-known sportsman and field naturalist. I have a note that I shot a Solitary Snipe here on the 18th September, 1884, in a young wood of Scot's fir and larch, recently planted, on extremely sandy, dry soil.—W. H. ST. QUINTIN, Scampston, Yorks.

——: o :——

We have recently received a paper on 'The Relationship of the Tetracoralla to the Hexacoralla,' by W. I. Robinson (*Trans. Connecticut Acad. Arts and Sci.*, Vol. XXI., pp. 145-200) in which Yorkshire and other northern fossil corals are referred to.

Mr. J. F. N. Green's Presidential Address to the Geologists' Association, on 'The Vulcanity of the Lake District,' appears in the Association's *Proceedings*, Vol. XXX., part 4, issued in December. It is illustrated by plates containing excellent photomicrographs of Lake District rocks.

In the *Transactions of the London Natural History Society* for 1918, we note the following under date April 9th—'Mr. Austin recorded a flock of about two dozen magpies at Kirkstall, Yorkshire, and near the same place a pair of corn buntings on March 29th last.' We can't understand how he missed the sparrows.

The ninety-sixth Report of the *Whitby Literary and Philosophical Society* is quite a useful publication. Besides the details of the Society's year's work, there are natural history notes, meteorological tables, a reprint of Mr. J. T. Sewell's paper in *The Naturalist* on 'Coast Erosion at Whitby,' and a paper by Mr. J. W. Barry on 'The Floods of August, 1917, and other local floods.' This last is also sold separately as 'Whitby Museum Publications, No. 1,' at sixpence.

CORRESPONDENCE.

CAUSE OF MELANISM IN *PHIGALIA PILOSARIA*.

I can assure Mr. Porritt (see *The Naturalist* for November, pp. 373-74) that a visit to Bingley Wood would soon convince him that a dark or black *pilosaria* is more easily seen on the trunk of an oak tree than is the type, for all, or nearly all, the trunks of oaks in Bingley Wood are covered by a lichen, which gives to them a greenish colour, differing in this respect from many other trunks of trees in other parts of this country. When collecting *pilosaria* in former years, I have often remarked : ' How wonderful the combination of colours on the wings of the type form of *pilosaria* are matched by those on the oak trunks and how well camouflaged they are when at rest.'

Pilosaria was a very stable species when I first became acquainted with it, and remained such until the late seventies or early eighties of the last century, when at least a large proportion of this species suddenly changed in a few years, from being a ' brindled beauty,' to a unicolourous olive or black beauty,' and this change was brought about, not because of an increase of smoke—there was less, not more, smoke at the period when the insect began to shew a tendency to melanism. In Bingley Wood the atmosphere is comparatively free from smoke. *Pilosaria* has not as many bird enemies as many other moths which appear on the wing in the summer season.

The fatal weakness of the ' smoke theory ' is simply that any change effected under the theory must be through the operation of the law of Natural Selection, which works by exceedingly small and almost invisible transition, but, accepting the theory of retarded development, one might not unreasonably expect changes in the direction of Melanism within a few years, which might involve centuries under the reign of the law of Natural Selection.

I still think that the sudden change to Melanism was due to a cause which operated not when *Pilosaria* had reached its perfect stage, but this force must have been brought into play whilst in the pupal condition—to suppose otherwise would almost seem to be inconceivable—I know of no case where sudden changes of this nature have been affected under Natural Selection. If Melanism is more marked in high altitudes or latitudes, on mountains than plains—this would seriously invalidate the ' smoke theory,'

The late Lord Walsingham, in his address to the Yorkshire Naturalists' Union at Doncaster, March, 1885, ' On Melanic Variation in Lepidoptera of High Latitudes,' gives an account of Mr. Meek sending out a collector in 1880 to the Shetland Isles, who brought back a considerable collection, which were noticed at length by Mr. J. Jenner Weir in *The Entomologist* of that year. ' The interest excited by this collection induced the same collector Mr. McArthur, to revisit the islands in 1881, to make an expedition to the Island of Arran in the following season, and to spend three months of 1883 in the Island of Unst, the most northerly of the Shetland group. Mr. Jenner Weir has described the results of all these expeditions in *The Entomologist*, Vol. XIII., pp. 249-289 ; Vol. XIV., p. 278, and Vol. XVII., p. 1.'

The tendency of this variation *was almost in all instances in the direction of Melanism*, except in the more *southern and Western Island of Arran*, and his Lordship goes on to say that this same tendency is observable in the majority of the Lepidoptera of the whole Arctic and Sub-Arctic regions when contrasted with their more southern representatives. Mr. W. A. Forbes remarks in *The Entomologist's Monthly Magazine*, Vol. XIV., p. 16, ' In looking through Dr. Staudinger's Catalogue, I was most struck by the fact that in nearly every case where a local form (whether a variety or aberration) from the Alps is noticed, it is characterised as being *obscurior* or *multo-obscurior*, or with some of the markings *obsoleta*, and goes on to notice the *number of normally*

black or dark species in the Alps, for example, *Erebia, Psodos* and some of the Pyralides. It would therefore appear that this tendency to Melanism first manifested itself in high latitudes where the atmosphere is absolutely free from smoke, and therefore the ' Smoke theory ' cannot account for this tendency to Melanism in those regions, and some other explanation will have to be found.

I hold no brief for the ' retarded development ' theory, and will discard it at once for the ' smoke theory ' or any other which can furnish the weightiest reasons for its support.—E. P. BUTTERFIELD, Bank House, Wilsden, Bingley.

I will only say that so far as we know to the contrary, *Phigalia pilosaria* has occurred in our Yorkshire woods for possibly hundreds of years, and no doubt cold and late Springs have during all that period occurred just as they do now. How is it then, if Mr. Butterfield's theory of retarded development be true, that melanism did not appear in the species long before it did? Far more melanic species, too, are on the wing in the summer and autumn than in the spring, and these are from larvæ which have fed up in spring and early summer, and have spent only several weeks in the pupal stage.—G.T.P.

——: o :——

Mr. J. Redwood Anderson in **' Walls and Hedges,'** (London : Sidgwick & Jackson, 83 pp., 3s. net.) has put together a series of poems, remarkable alike for their originality and beauty. Mr. Anderson leaves the well-worn paths so frequently tramped by poets, and sees beauty in bridges, oil mills, docks, and chimneys, even in plate glass, and he is able to interpret the beauties he sees in language quite as charming. Who but Mr. Redwood Anderson could thus describe a railway bridge?

" Here, with one leap,
The bridge that spans the cutting; on its back
The load
Of the main road,
And under it the railway-track."

And later, in referring to the train—

" Now from the gloom
Of that soft distance, loom
Three lights and, over them, a brush
Of tawny flame and flying spark,
Three pointed lights that rush
Monstrous, upon the cringing dark.'

His ' Vision ' is also a fine piece of word painting, and for beauty and brevity, the following fourteen words would be hard to beat :—

' Calm was the night—
The stars aloft
Flowered heaven with their soft
Large light.'

In gazing at the prospect of inartistic and air polluting chimneys, it is perhaps a little consoling to know that—

' They are the masts of ships that stand
Immovable on land
Yet bring to port a richer merchandise
Than all the world's round argosies;
Not ocean-billows but the waves of time
They sail sublime.'

There is a freshness and charm about these poems, and while in many cases the country lanes and hedges, the views seen by poets of the last century, have given place to walls and mills, it is pleasant to find that the author can still see poetry and beauty in the changed conditions.

NORTHERN NEWS.

Besides the usual excellent summaries of 'Advances in Science,' *Science Progress* for January contains articles on 'Evolution and Irreversibility,' by A. J. Lotka, and 'Rhythm in Nature,' by F. W. Flattely. There are also notes, reviews, etc.

Between January 1st and November 30th, 1919, the number of visitors to the Zoological Gardens, London, showed an increase of 653,187, and the admission fees showed an increase of £22,977, as compared with the corresponding period during 1918.

Mr. S. Matthewman, of 52 Belle Vue Road, Leeds, is publishing a 'Year Book' giving details of the officials in the various scientific societies in the county, and asks that the secretaries will forward the necessary details to him as soon as possible.

In a good list of additions in the Twelfth Annual Report of the National Museum of Wales, we notice 'A Lyre Bird, a Platypus, and several other Australian Mammals.' It is also surprising how many people have presented 'A Timberman Beetle (*Acanthocinus aedilis*).'

Part 6 of Witherby's *Practical Handbook of British Birds* (pp. 337-400, 4s. net), deals largely with the warblers, and consequently is of special interest to our Sussex friends, as in that county the rarer warblers most do congregate. There is a plate of warblers and another of thrushes.

We see in a well-known Natural History Journal that a paper, correctly given in the heading as dealing with *Hemiptera-Heteroptera*, appears on the next page as *Hemiptera-Hemoptera*, while in the contents it is described as *Hemiptera-Homoptera*. We can only put this down to the Yule-tide revels on the part of the printers' devils.

The death is announced of Alderman John Brown, at one time Mayor of Hull, and Chairman of the Hull Museums Committee. He was the head of the firm of A. Brown & Sons, the publishers of the Yorkshire Naturalists' Union. He took a keen interest in anything educational, and was a prominent member of the antiquarian, natural history and other societies in Hull and district.

At the recent Annual Meeting of the Eden Fishery Board at Carlisle, discussing the ravages of predatory birds amongst the young fish, the clerk reported that the most destructive bird was the cormorant, which haunted the river from the Solway to Armathwaite. It was urged that riparian owners should instruct their keepers to kill as many of these birds as they could. It was also agreed to organise a raid on the nesting places of the cormorant on the Scottish side of the Solway, and ask the Cumberland Sea Fisheries Committee and the Scottish Boards to assist in destroying these birds.

In the *Geological Magazine* for January, the editors congratulate themselves, give some elementary lessons on editing, and then make the welcome announcement that the 'Decades' are to be dispensed with—the present issue being the first part of Volume LVII. The price is now 2s. 6d. a month. Generally, the number is much more interesting than usual, and contains several notes relating to the geology of the northern counties. Among these are Pre-Triassic Swallow-holes in Furness, by B. Smith; The Distribution of *Productus humerosus*, by T. F. Sibly, and The Ammonite Siphuncle, by A. E. Trueman.

Part 2 of '*A Geographical Bibliography of British Ornithology*,' (Witherby & Co., pp. 97-192, 6s. net.) has appeared promptly. It includes items referring to the counties occurring alphabetically between Essex and London and Middlesex. It is interesting to note that the first record for Lancashire is Leigh's *Natural History of Lancashire*, etc., (1700); while for Lincolnshire the earliest item recorded is: 'A most wonderful and true report . . . . of divers unknown Foules . . . . taken lately at Crowley in the Countie of Lyncolne. London, 1586'; the 'unknown Foules' being Ruffs. These county lists will certainly be of great value to future workers.

Twelve Illustrations, beautifully printed in colours and Mounted on Stout Boards, 24 × 19 inches, eyeletted and strung, including Descriptive Handbook, in Leather Board Case 17/6 net the set.

BROWNS'
ENEMIES OF THE GARDEN

Reproduced in the very best style of Lithography from special designs by
H. W. BRUTZER, M.A., F.E.S.

THE 12 ILLUSTRATIONS ARE AS FOLLOWS :

1. OUTLINE OF INSECT LIFE.—Hymenoptera, Coleoptera, Lepidoptera, details.
2. LACKEY MOTH.—Egg, Caterpillar, Nest, Cocoons, Female Lackey Moth, Egg Cluster.
3. SMALL ERMINE MOTH.—Eggs, Caterpillar, Cocoons, Ermine Moth, Nest in Apple Tree.
4. GOOSEBERRY SAWFLY.—Egg, Larva, Larva (last stage), Leaf, Sawfly, Branch, Cocoon.
5. ASPARAGUS BEETLE.—Eggs, Larva, Beetle, Pupa, Asparagus stripped of leaves, Cocoon.
6. BLACK CURRANT MITE.—Mite, Big Bud on Branch, Section of Bud with Mites.
7. RASPBERRY STEM BUD CATERPILLAR.—Caterpillar, Chrysalis, Moth (enlarged), Raspberry Cane.
8. MILLIPEDES and CENTIPEDES.—Three destructive Millipedes and two useful Centipedes.
9. SCALE.—Currant Scale, Scale on Aralia and Myrtle Leaves and Mussel Scale.
10. WIREWORMS.—Click Beetle and Skip Jack showing details.
11. PEA THRIPS, COCKCHAFER, DADDY LONGLEGS, WOOD-LOUSE and EARWIG, showing sections and details.
12. SOME USEFUL INSECTS.—Dragon Fly, Ichneumon Fly, Lady Bird, Tiger Beetle, Hover Fly, Glow Worm, Cocktail Beetle, Lacewing Fly.

All the designs are printed on appropriately tinted backgrounds, devoid of any white border, thus enabling the various sections on the Charts to be seen with great clearness.

We always have enemies within our garden-gates, and would-be gardeners are often reminded that the results of their labours may be brought to nought or greatly lessened by the work of destructive insects. There are other insects, however, that are our Allies, as they live on the destructive pests and thus help to protect the vegetables and fruit. It is, therefore, most necessary to be able to distinguish between useful and destructive insects, hence the popularity of **Browns' "Enemies of the Garden,"** as the charts show at a glance how to tell our enemies from our friends. A set of the illustrations should be exhibited in all our schools or village clubs, as the knowledge which they and their accompanying handbook convey is essential to successful gardening. The small expenditure on same will prove a truly profitable investment.

LONDON : A. BROWN & SONS, LTD., 5 Farringdon Avenue, E.C. 4.
AND AT HULL & YORK.

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
Feb 1st, 1920.

MAR. 1920. No. 758
(No. 532 of current Series).

THE NATURALIST.

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

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;
AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, D.Sc., F.R.S., F.L.S. **G. T. PORRITT, F.L.S., F.E.S.**
Prof. P. F. KENDALL, M.Sc., F.G.S. **JOHN W. TAYLOR, M.Sc.**
RILEY FORTUNE, F.Z.S.

Contents :—

LONDON:
A. BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.
Printers and Publishers to the Y.N.U.

Price 9d. net. Prepaid Subscription 8/6 per annum.

BOOKS WANTED.

Alford Nat. Hist. Soc. Reports. Set.
Barrow Nat. Field Club Trans. Vol. VII.
Bath Field Nat. and Arch. Soc. Vols. VIII.-XI.
Bedfordshire Natural History Society Proceedings. Set.
Birmingham Nat. Hist. and Phil. Soc. Proc. Vol. I., part 2.
Brighton and Sussex Natural History Society Reports, 1870, 1872-3.
Burnley Lit. and Sci. Soc. Parts 8, 12, 13, 16-27, 29-
Chester Soc. Nat. Science: Ann. Reports, i.-iv.
Cleveland Lit. & Phil. Soc. Trans. Science Section or others.
Croydon Nat. Soc. 6th Report.
Dudley and Midland Geol. etc., Soc. Vols. II.-IV.
Discovery. (Liverpool, 4to). 1891.
Derby Arch. and Nat. Hist. Soc. Part 21.
Devonshire Assoc. Adv. Science. Vols. I.; II., III., XXXV., 47-
Dublin Geol. Soc. Vol. I., pt. 1, 1830?; Vol. VII., parts 1-3 (or complete Vols.). 1855.
Eastbourne Naturalist (1 part).
Eastbourne Nat. Hist. Soc. Vols. II.-III. (or parts), and part 6 of new series.
Edinburgh Geol. Soc. Vol. III., part 3; Vol. IV., part 1.
Frizinghall Naturalist. (Lithographed). Vol. I., and part 1 of Vol. II.
Garner. No. 60.
Geol. and Nat. Hist. Repository, Mackie's. Vols. II., III.
Geol. Assoc. Proc. Vol. I., Part 1.
Geol. Soc., London, Trans. 4to. 2nd series, Vols. IV.-VII. Pts. 1-3 (1836-52).
Geol. Soc. Quarterly Journal. Parts 5 and 7.
Geological Magazine, 1890-1-2-4.
Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).
Illustrated Scientific News. 1902-4. (Set).
Journ. Micrology and Nat. Hist. Mirror. 1914—

Apply—**Editor, The Museum, Hull.**

BOOKS FOR SALE.

REPORT ON AGRICULTURAL DAMAGE BY VERMIN AND BIRDS IN THE COUNTIES OF NORFOLK AND OXFORDSHIRE IN 1916. R. T. Gunther. 1/6
HUNTING IN BRITISH EAST AFRICA. Madeira. 10/-
SPENCER FULLERTON BAIRD. By Dall. 7/6
THE GREATEST LIFE. Leighton. 3/-
THE YORKSHIREMAN. By a Friend. Vol. I., Pontefract, 1833. 3/6
DERBY: ITS RISE AND PROGRESS. Davison. 2/6
ANIMAL ROMANCES. Renshaw. 4/-
THE SCIENTIFIC ENQUIRER. Cloth. Vols. I. and III. 2/- each.
THE MAKING OF SPECIES. Dewar and Finn. 4/-
RAMBLES OF A CANADIAN NATURALIST. Coloured Illust. S. T. WOOD. 3/6
HOW TO LAY OUT SUBURBAN HOME GROUNDS. Kellaway. (Pubd. at 8/6). 3/6
WHAT IS INSTINCT ? C. Bingham Newland. 2/6
VIGOUR AND HEREDITY. J. Lewis Bonhote. 6/6
WHITE'S NATURAL HISTORY OF SELBORNE. Coloured Illustrations by Collins, 6/-
RAMBLES IN THE VAUDESE ALPS. F. S. Salisbury. 2/-
TRANS. MANCHESTER GEOL. SOC. Vol. I., 5/-.
JEWITT'S RELIQUARY. Vol. III., 3/6.
LEE'S NOTE BOOK OF AN AMATEUR GEOLOGIST. 4/6.
EXTINCT BRITISH ANIMALS (with account of White Wild Cattle). J. E. Harting. 6/-
GLIMPSES OF INDIAN BIRDS. By D. Dewar. 3/6
BIRDS OF CALCUTTA. By F. Finn. 1/6
HITCHCOCK RELIGION OF GEOLOGY. 2/-.
BRITISH ORGANIC REMAINS (GEOL SURVEY). Decades I., II., VII., 1/6 each.

PUBLISHED RECORDS OF LAND AND FRESH-WATER MOLLUSCA, EAST RIDING. (Maps). T. Petch, B.Sc., B.A. 1/6
DIATOMACEÆ OF HULL DISTRICT. (600 illustrations). By F. W. Mills, F.R.M.S., and R. H. Philip. 4/6

Apply—**Dept. C, c/o A. BROWN & SONS, Ltd., Hull.**

NOTES AND COMMENTS.

BRITISH BIRDS AND EGGS.*

We have been frequently asked to recommend a reliable book with coloured illustrations of British Birds and their Eggs, published at a reasonable price. Hitherto this question has not easily been answered. In future the reply will be 'The Birds of the British Isles and their Eggs,' by our old

Nest of Bluethroat.

friend Mr. T. A. Coward. The volume forms one of Warne's well-known Wayside and Woodland Series.

THE ILLUSTRATIONS.

Quite apart from the carefully compiled details relating to each species, by Mr. Coward, the illustrations are more than worth the small price asked for the whole book. There are no fewer than 242 accurately coloured illustrations by Archibald Thorburn and others reproduced from Lord Lilford's work 'Coloured Figures of the Birds of the British Isles,' and 65 photographic illustrations by Richard Kearton and others. One of the smaller of the latter we are permitted to reproduce. The coloured illustrations of the birds are much more successful than those of the eggs—those of the eggs of the Comorant, Gannet, Owls and Woodpeckers being hardly worth the cost of the half-tone blocks used in their production. This volume is 'Series I.,' and comprises the families Corvidæ to Sulidæ.

* *The Birds of the British Isles and their Eggs*, A Pocket Guide with descriptive Text, by T. A. Coward, F.Z.S. (First Series). 376 pp., 12/6 net.

LEEDS AND SHEFFIELD.*

These two volumes form part of ' The Story of the English Towns ' Series, issued by the Society for the Promotion of Christian Knowledge. The idea is admirable and the books are written in such a way that they will appeal equally to the elder scholars and the intelligent citizen. Mr. Fletcher is well known as a writer on Yorkshire history, and in these two books he traces the evolution of two important Yorkshire cities from small beginnings to their present status as industrial centres. The story in each case is well written—almost fascinating, and made the more readable by the reproduction of plans showing the growth of the places from early times. It is to be hoped that the series will extend so that in time we may have a record of the growth of the principal cities and towns in the British Isles.

A BIRD STORY.

We learn that a peregrine falcon is at present paying a visit to Derby, and doing such a serious amount of damage that the price of £5 has been put upon its head. It gets below its quarry, then suddenly soars and sweeps the head right off with its beak, at the same time catching the body of its victim in its claws. Sometimes, after one or two such deadly swoops, it will discard its dead victim, but the last of the series it carries away safely tucked away under its tail. Thus, says a writer in the *Liverpool Post*, after hundreds of years, is this falcon, in its untrained, savage way, doing precisely what it was trained to do with greater discrimination on the days of Alfred the Great. Its flight is extraordinarily rapid—150 miles an hour. It is said to be gifted with a remarkable degree of longevity, and it is reported that in 1797, at the Cape of Good Hope, a falcon was caught which showed no signs of decreptitude, and had on a golden collar, with an inscription stating that in 1610 it belonged to James I., King of England. It was, therefore, over 187 years old.

PARTURIUNT MONTES, NASCETUR RIDICULUS MUS.

Well, after all the preliminary puff, which appeared in the leading dailies up and down the country, the reports of the various meetings of societies and committees, the marvellous lists of editors, trustees, committees and contributors, which have been published broadcast, the lists of societies co-operating, from the National Union of Teachers to the British Psychological Society, and the advertisements which have appeared, we are profoundly disappointed in part I. of

* Leeds, by J. S. Fletcher, 127 pp. Sheffield, by J. S. Fletcher, 127 pp. London : S.P.C.K., 3/6 net each.

Discovery. We never remember so massive a mountain in labour so long with so little a mouse as the result.

DISCOVERY.

The paper seems to possess a little of the characters of *Knowledge, Science Gossip*, and *Science Siftings*, but without the individuality of either. We had expected at least that it would have been equal to our old friend *Knowledge*, but that paper was a king compared with *Discovery*. But what can we expect when the editor tells us on the first page: 'Whether we fail or not remains to be seen. *We mean to try*!' Like the papers mentioned, the editor of *Discovery* intends to record the doings of the scientific world in a simple tongue 'which we plain men do understand,' and goes on to explain that by this he means 'English!' We learn that the paper was really born in Manchester, with a Belgian botanist as parent; it is edited in Sheffield, printed in Aylesbury (?) and published by Mr. John Murray in London.

CONTENTS.

The articles are on 'The Secret of Philæ,' by Prof. R. S. Conway; 'Smoke Screens,' by Dr. S. Price; 'Modern Study of Dreams,' by Prof. T. H. Pear; 'Discovery and Education,' by Mr. A. L. Smith; 'The Conference of Paris,' by Mr. J. W. Headlam-Morley; 'Sound-ranging,' by Mr. A. S. Russell, and 'Spitsbergen,' by Dr. R. Brown. There are two illustrations, one gives a view of some large plum-puddings in the foreground and some men on a gallows in the distance, labelled 'Philæ and its Temples'; the other consists of some radiating lines representing a sound-ranging section. *But*, it is obvious that the editor, the trustees, the committee of management, the 'representatives of bodies,' the representatives of learned societies, and the publishers, do not look upon *Discovery* as having any permanent value—or the pages of advertisements would surely not be numbered along with the text—and what is far worse, several of the pages are half reading matter and half advertisements. How can one decently bind the publication in such circumstances? Even if the full pages of 'adverts' are torn out the volume, when and if completed, will begin with page 3, as far as this part is concerned, ends with page 28½, and if the next part is similar to this, will follow on with page 34. We must say from the wealth of intelligence concentrated in *Discovery* we had fears for our old friends *Nature, Science Progress* and others. As it is, *Discovery* will probably help them.

HULL NATURE POETS.

The Hull Literary Club Magazine, Vol. V., part 3, recently issued, is 'strong' on poetry. The Rev. A. J. Parkes has written

15 verses 'To a Swallow'—ten of which are printed. Mr. Maurice Philip (son of a prominent Yorkshire naturalist, the late R. H. Philip) contributes a poem, three verses from which we quote, entitled :—

'HOLDERNESS.' *

We boast no idle wind-swept downs,
No towering peaks are ours,
But ordered fields of deep lush grass
And hedge-rows rich with flowers,
And winding lanes that come at last
To lonely garth or ancient stead,
Past green churchyards that hold in peace
Our still more ancient dead.

* * * *

I will go out by Hornsea Mere
When in the first dim light
The wildfowl seek on countless wings
The seas of their delight.
And in the hush that comes with dawn
I will in song give praise
To Him, whose will hath sent me forth
To tread these pleasant ways.

For each must sing the lands that bring
To each his soul's content,
For one the snow clad northern hills,
As one the Orient.
Give me the land that lies between
The Wolds and Withernsea,
From surf-torn Spurn to Flamborough Head,
Aye ! Holderness for me.

EDWARD LAMPLOUGH.

Mr. F. Noble Wood writes an appreciable poem on the late Edward Lamplough, 'Local Historian, Poet, Naturalist,' who died last year (see *The Naturalist* for May, 1919, p. 181); as follows :—

Seeker of loveliness in wood and field
And sweet-tongued minstrel of delighting hours,
Pure were your thoughts as daisies after showers,
And rich with praise your reveries' thoughtful yield ;
To your bright mind the mellowed past revealed
It's stirring lore, and, summoned by your powers,
Norse sea-kings sailed, or, from now-ruined towers
Rode knight with serf, and sword rang loud on shield.

* This is a very good parody on a well-known poem entitled 'Sussex.'—Ed.

Time takes thy breath and earth receives thy dust,
Too paltry spoil when all that's worth abides,
So oft your words shall home on memory's tides
And verse and tale oblivion's hand out-thrust ;
Wise brain, true heart, lover of life and song,
What loftier themes now to thy harping throng !

HUDDERSFIELD'S NEW MUSEUM.

Dr. T. W. Woodhead recently gave an address on Huddersfield's New Museum.' He showed plans of the buildings and of the estate at Ravensknowle, with which locality the Tolson family have had connections since the seventeenth century. Two magnificent houses, together with outbuildings and the surrounding estate of six acres, have been very generously given to the town by Mr. Leigh Tolson, who also offers, at very reasonable terms, a further area of seven acres. The whole combine to make an ideal site for a local museum, the scheme and possibilities of which Dr. Woodhead outlined. Such a museum should seek to demonstrate the history of Huddersfield in its widest sense, and a great feature should be the facts which have determined the position of the town—how Huddersfield comes to be situated at the particular place where it is; the geology, climate, topography and natural history; the peculiar quality of water that has meant so much to one of Huddersfield's important industries; the relics of the ice-age; the very early evidences and handiwork of man; the local coinage which had established certain important facts in British history ; the Roman, Anglo-Danish, and Norman periods ; the cottage industries which were the forerunners of modern factories ; the pack-horse trackways, waterways, and railways ; and other features illustrative of every phase in the development of local history. The lecturer suggested the possibility of monographs being prepared by specialists, and each dealing with a particular ' age ' in the history of the town.

FOOD OF NIGHTJAR.

The Journal of the Ministry of Agriculture (formerly *The Journal of the Board of Agriculture*) for January contains an article on ' The Food of the Nightjar,' by Dr. W. E. Collinge. After making careful examination of the contents of the stomachs of sixty-two examples, which contained 88 % of injurious insects and 12 % of other insects, he concluded ' From long observation of the Nightjar and its habits we believe that it is very uncommon for this bird to feed during the daytime, although a few instances of day-time feeding are on record ; nevertheless, the amount of food it takes from sunset to sunrise must be considerable. Di-

gestion, we know, is fairly rapid, but in all the sixty-two birds examined there was only one of which the stomach was about three-quarters full; in the remaining sixty-one obtained between the hours of 10 p.m. and 4 a.m., the stomach was tightly packed with food only recently taken, and the remains of food previously obtained. In view of the very beneficial nature of this bird's work, farmers would do well for the general good and their own interests to use their utmost efforts to protect and preserve it. As far as any future legislation is concerned, the Nightjar, and its eggs, should be protected during the whole of its residence in this country.

WORK FOR YORKSHIRE NATURALISTS.

The year 1920 should see a revival of field work, and it seems desirable that the Committee of Suggestions, of the Yorkshire Naturalists' Union, which has not been elected since 1914, should be revived. New outlets for the energies of the Union are required now that our county Floras and Faunas are published, and the additions to be made to them are few. New members can be attracted by interesting schemes of work such as require the wide view of a large and comprehensive Union. One such scheme was clearly indicated by the Suggestions Committee in a paper in *The Naturalist* for 1904, where a plea was made for the study of Peat, and a scheme of work was outlined. Unfortunately the later idea of dealing with a defined area (Thorne Waste) could not be carried out owing to the necessary permission not being available; then, before the work at the Stanbury Moors and Austwick Moss areas had been fully established, our late President, Dr. W. G. Smith, left Leeds for Edinburgh, and apparently the lack of a directing mind caused the scheme to be held up indefinitely.

THE STUDY OF PEAT.

The Monograph on the Constitution of Coal by Stopes and Wheeler, (Dept. of Scientific and Industrial Research, 1918), calls attention to the importance of a thorough knowledge of the manner of peat formation as a help to the elucidation of the history of coal. A comprehensive Monograph on the Peats of Yorkshire, dealing with :—Area, Thickness, Present Condition (Accumulation or Loss), Surface Vegetation, Plants and Animals preserved in it, Subsoils, etc., would be of the highest scientific value. It has attracted some individual interest as shown by occasional notices in *The Naturalist*, but it is only by the co-operation of workers in all departments of Natural History, that sufficient data can be accumulated, upon which to base sound conclusions, and bring the work to a successful issue. It is suggested a

meeting of those interested should be called in connexion with the next field excursion of the Union.

CRETACEOUS POLYZOA.*

In these three papers, certain features in the evolution of Cretaceous Cribrimorph Polyzoa are enlarged upon. Perhaps the most important, at least as far as the groups described are concerned, is the increasing superfluity of skeletal matter, which appears ultimately to cause the extinction of every lineage. The secretion of Calcium Carbonate is regarded as an accident liable to befall any lineage which already possesses a chitinous skeleton ; and, when once this secretion begins, it continues during phylogeny at an increasing rate, until the skeleton becomes a burden and then a danger to its possessor. The evolution and complexity of the skeleton is thus the expression of the organism's attempt to deal with its superabundance of material. Moreover, since evolution is often seen to proceed in 'bursts' at 'expression points' (*periodicity* is a feature of evolution), it is suggested that Calcium Carbonate secretion is controlled by inhibitive agents, and it is when this control is lost under the insistence of the tendency to secrete, that an 'expression point' occurs in evolution.

DEFINITE LINES OF DEVELOPMENT.

Another exceedingly important feature is exhibited by these evolving lineages, namely, the repetition in lineage after lineage of the same general plan ; so that we are justified in speaking of an *orthogenesis*, or definite development, according to which we may predict for a primitive form what its general evolutionary future is to be. It is thus that both parallel and convergent *homœomorphs* (similar forms with different ancestry) are freely produced. The different ancestry of convergent *homœomorphs* is seen in the differing early stages of their colonial skeletons. Colonial ontogeny (*Astogeny*) must be distinguished from individual ontogeny, though it has the same evolutionary significance. It is to be hoped that evidence from other families of cretaceous Polyzoa, will shortly be published. The peculiar importance of Dr. Lang's work to the stratigraphical geologist is the extreme value of palæontological evidence derived from a *proper* and *careful* zonal collection of fossils.

---

* *The Pelmatoporinae*, an Essay on the Evolution of a Group of Cretaceous Polyzoa : by W. D. Lang, Sc.D., F.G.S. ; *Phil. Trans. Royal Soc.*, series B., vol. ccix., pp. 191-228, figs. 1-72 (1919).

* The Kelestominae, a subfamily of Cretaceous Cribrimorph Polyzoa ; by the same author : *Quart. Journ. Geol. Soc.*, vol. lxxiv., pp. 204-220, figs. 1-12 (1919).

* Old age and Extinction in Fossils, by the same author : *Proc. Geol. Assoc.*, vol. xxx., pp. 102-113, fgs. 19-21 (1919).

CIRRIPEDES FROM THE CHALK.

Thanks to the careful and able work of Mr. T. H. Withers, we have now exact definition and differentiation of the chalk Cirripedes. The final paper of the descriptive series appears as ' The Cirripede Genus *Stramentum* (*Loricula*) : its History and Structure (*Ann. Mag. N.H.*, January, 1920). Further material may hasten future papers on the Phylogeny of the group. *Stramentum* is a remarkable trilobite-looking form which attached itself by a peduncle to Ammonites, etc., was first described by Sowerby and Darwin from an isolated specimen, and called *Loricula pulchella*. In 1907 that indefatigable collector Dibley found a magnificent series of three individuals in situ on an ammonite from the type locality near Rochester, Kent. All are in the British Museum. The paper is illustrated by two plates in half-tone, from perfect photographs by Phillip Dollman, whose mastery over technical difficulties in solid objects is well-known.

BRONTOSAURUS.

We expected that so soon as our journalists were able to spell ' Brontosaurus ' properly, we should be having it served up regularly in the press. The following note appeared in a recent newspaper, but from the description given it is apparent that it is neither ' strange ' nor a ' fish,' but a fairly common mammal :—' A Sea Brontosaurus ? Strange Fish Cast Ashore on the Scottish Coast.—A large and very strange-looking fish has been cast up on the south-west coast of Mull at Loch Coridan. The fish, 6 ft. 4 in. in. length, measured 3 ft. 2 in. at the thickest girth and 30 in. round the head, which had a peculiar blowhole on the top. Numerous tiny teeth in each jaw dovetailed exactly into each other. The tail lay flat on the beach when the fish was lying back up.' Another paper, recording the discovery of a ' kitchen ' of primitive man in Alsace, where remains of mammoth, horse, rhinoceros and hyæna were found, heads the paragraph ' Home of the Brontosaurus,' and even *Punch* has ' got it ' and tells us that the inhabitants of a small town ' clubbed together and went as a Brontosaurus to a fancy dress ball.'

——: o :——

No. 85 of *The Journal of the Quekett Microscopical Club* contains obituary notices of two Yorkshiremen, viz., John Hopkinson (already referred to in *The Naturalist*) and George S. West, son of the late William West, of Bradford, who was at one time President of the Yorkshire Naturalists' Union. Like his father, Professor West was a keen botanist and an excellent draughtsman. Jointly with his father he prepared many valuable monographs and papers on diatoms, desmids, and other microscopic forms. He was professor of Botany at the University of Birmingham, where his library and specimens are to remain ; his drawings are bequeathed to the Department of Botany of the British Museum.

THE NATURALIST AND THE GARDENER.*

WILLIAM G. SMITH, B.Sc., PH.D.

MANY naturalists have used their gardens as places for the study of plants and insects, and the allotment as a war measure has increased the number of people who till the soil and follow the development of various crops with a gardener's interest.

This combination of naturalist and gardener presents an opportunity to one, like myself, who lives in an environment where cultivated plants, their health and diseases, are every day under consideration.

The presidential address to the Yorkshire Naturalists' Union must appeal to an audience that includes all classes and conditions. Yet all meet on common ground, being students of natural history, plants, animals, rocks, and other aspects of out-door life. Directly or indirectly, all take an interest in the greatest of all studies—the problem of life. This interest should not be difficult to rouse in the great county of Yorkshire. Its hills and dales are carved out of rocks that are a text-book in themselves, and they carry a plant and animal life so varied that it almost forms an epitome of the natural history of Britain.

It has been my good fortune to pass eleven years in Yorkshire, and my special line of study has taken me into nearly every corner of your broad acres. During these years it was of the greatest advantage to have as guides up your dales and over your hills, men who were so full of enthusiasm for natural history that one could not avoid being influenced. Each of you, as geologist, antiquary, or naturalist, will recall memories of your favourite leaders. Any list I could give would be imperfect, but I may be permitted to name three—Chas. Crossland, Wm. West and W. Denison Roebuck. The secret of success in these and so many others was perennial youthfulness and sympathy with the younger men. These leaders were never seen to greater advantage than on the excursions in the field, and it is impossible to estimate how much the present generation owes to these older naturalists.

These reminiscences are introduced to recall to each one his excursions in Yorkshire and elsewhere. What one knows of natural history has its foundation in actual out-door experience, and books, though useful, are only a supplement. The out-door excursion is full of new surprises and few return from a day's outing without having learned something. Yet

* Being the Presidential Address to the Yorkshire Naturalists' Union, delivered at Doncaster, December 6th, 1919.

1920 Mar. 1

every naturalist must feel that his outings have been too few and his observations too limited to cover any great extent of natural history. The pictures are like a cinema film cut up into its portions and shuffled. The various single pictures seem to have some connexion, but we cannot piece them together into a consecutive story. The jig-saw puzzle has its charms, but it loses interest if we cannot see the picture growing towards completion.

Why not use the garden or allotment as a place for continuing our studies in natural history?

Every garden, however small, offers great facilities. The attempt to raise successful crops will promote an interest in the treatment of the soil, and by comparing notes with neighbours, one can gather information on species and varieties suited to the locality. Insects and fungus pests are rarely far away, and will demand careful study of their habits with a view to extermination. The garden is always at hand to occupy a spare hour, and its attractions extend through even the short days of winter. The busy man can find time for visits to his garden, when he cannot get away to the hills and woods.

The sphere of garden observations is too wide to be dealt with as a whole, hence I propose to emphasise one aspect, the origin of cultivated plants and their varieties. The gardener knows more of the history of his plants than is known about wild ones. The field naturalist, with his more limited opportunities, has a less complete record, and in his haste to formulate definite views on such things as varieties and hybrids he tends to fall into errors that might be avoided if he were more familiar with the methods of the gardener.

When a gardener sows the seeds of some named variety of cabbage he expects to obtain plants with a large single head like a gigantic bud, and he expects that all the plants from the same packet will be closely similar or true to type. There are many varieties of cabbage, all more or less true to type, including forms light green, blue-purple and red-purple in colour, with smooth leaves or with wrinkled leaves of the winter Savoy type, and in general shape round-headed or egg-shaped. All these varieties have one feature in common—that almost all the aerial part of the plant goes to form a large terminal bud, the cabbage, which will ultimately produce flowering branches. None of these forms can be definitely distinguished by the seeds and seedlings, and the yellow flowers and seed-capsules are all alike. Hence the conclusion that all the varieties of cabbage are forms produced by man from some aboriginal wild plant.

But the list of the cabbage clan is not yet complete. One series has long stems bearing distinctly separate leaves; the

field kales have smooth leaves, the Scotch kale has curly leaves, and the Jersey cabbage throws out numerous branches from a main stem which may be ten feet high and strong enough to make a walking stick. A second series has the axillary leaf-buds developed into small cabbages—the Brussels sprouts. A third, the cauliflower varieties, have peculiar abortive flowers closely crowded and white at first, but branching later and bearing true flowers and seeds; a variety, the sprouting Broccoli, is more branched and bears numerous small heads useful as a vegetable. The Portugal cabbage or Couve Tronchuda is mainly used because its brilliant and variegated colourings add to the beauty of the decorative garden, but some strains yield useful cabbages, or the fleshy leaves may form a substitute for sea-kale. The last series has evolved on new lines, providing Kohl Rabi with the lower stems swollen like a turnip and used in the same way. This extensive list of varieties of the cabbage clan is not exhaustive, but it may suffice to indicate the bewildering variety of form and growth habit. If all these forms were found as wild plants, it is safe to say that they would be assigned to numerous species, and the makers of new names would have a busy time. Fortunately the gardener has observed the cabbage clan for a long time, and has left records which make it fairly certain that all the forms are descended from one ancestor.* Pliny (23-79 A.D.) distinguishes seven sorts, and his descriptions indicate that Roman gardeners knew the cabbage, tall and dwarf kales, kale-sprouts and kohl-rabi. Gerard ('Herbal,' 1597) includes fifteen figures of kales or coleworts, which show plants inferior to those of the present time, but recognisable as tall and dwarf, smooth and curled kales, red and white cabbages, Brussels sprouts and cauliflower.

The ancestral cabbage plant (*Brassica oleracea*) has been recorded from the coasts of Britain, the Channel Islands, and from Southern Europe, northwards to Denmark. There is always some doubt when a wild cabbage is found whether it is genuinely wild or a garden outcast, but in the latter case it is significant that the cultivated form slips back so easily to the ancestral form.

Before discussing the cabbage further, it will be useful to indicate the history of the turnips and beets. The turnip clan includes three distinct families, each with many varieties that come reasonably true from seed. The true turnip has

* A. de Candolle, 'Origin of Cultivated Plants,' English Edition, London, 1886. This summarises most of the older literature, and is supplemented from G. Henslow, 'Origin and History of our Garden Vegetables, and their dietic value.' *Jour. of Roy. Horticultural Society*, XXXVI., Parts 1, 2, 3, XXXVII, Part 1, 1910-11; and 'History of the Cabbage tribe, *idem.*, XXXIV, Part 1, 1908.'

grass-green seedling leaves, the later leaves being rough because of numerous hairs; the tubers are either white-fleshed or yellow-fleshed, and the skin varies from white and yellow to purple. The Swedes have glaucous-tinted seed leaves, and glaucous smooth later leaves, borne on a distinct 'neck' rising above the tuber; the tubers may be white-fleshed or yellow-fleshed, and further varieties are distinguished by colour (green, purple, bronze), or by form (round, tankard, etc.). The third group includes varieties of rape, some grown for the foliage for sheep, others for the oil-yielding seeds (rape, colza, etc.). The history of the ancestral forms is not so complete as that of cabbage. The older authors tend to regard them as descended from one plant (*Brassica campestris*.) This plant occurs in our flora, but it is probably a reverted form of the cultivated swede. A. de Candolle assumes it as a native of temperate Europe, and Fries has identified two wild varieties in Sweden, one has swollen roots, the other has slender roots more suggestive of the rape. Recent experiments on hybridising turnip and swede support the view that they are distinct, and on crossing behave like two species.

The parent plant of the Beets and Mangolds occurs on the coasts of Britain, on sandy and shingly beaches, salt-marshes, and about sea-cliffs round western Europe. The plant has a perennial rootstock, somewhat reddish and stout, but by no means so fleshy and tender as the cultivated forms. The leaves are also smaller and have longer petioles. The whole plant as seen on a shingle-beach does not suggest that it is any more useful than a dandelion; yet under the influence of man it has yielded numerous varieties. The aim of the gardener has been to develop a deep-red, edible beet, and many variations in shape have resulted. The perennial habit has been converted into a biennial. The demand of the farmer is for size and weight; hence the field mangolds. All are biennials, some races with yellow seedlings and yellow-fleshed tubers, others have red seedlings and more or less red flesh. A white-fleshed race with green leaves has been evolved as more suitable for sugar beet, and during the past fifty years the sugar content has been increased from less than 10 per cent. to 18 per cent. and over. The competition between beet as a source of sugar in Central Europe, and the true Sugar Cane of more tropical lands, has played no small part in the politics of Europe since the Napoleonic wars. The spinach-leaved beet, one of the newer garden products, differs from the others, in that the tuberous part is relatively small, while the green crisped leaves have been developed as a spinach-like salad vegetable.

This review of some garden plants brings into relief some fundamentals in natural science, important to botanist and

zoologist alike. The first is the recognition of variation. It is well-known to the gardener that some plants will show considerable variation if encouraged by cultivation. On the other hand there are species with which it is hard to break the type, but it is usually the case that when a species is studied intensively, as in the case of cultivated plants, variations become evident on close observation. The accumulation of evidence makes it clearer that all living organisms vary, but we are badly trained to recognise the variations. The object of all education is precision, whether in mathematics, history or classification in natural science. There is an old theory that species were the original creations, and every young naturalist has this idea. He expects all plants of a species—daisy or dandelion—to be so much alike that they can be described in a few lines, like coins minted from the same machine. It comes as a surprise that dandelions are not all six to twelve inches high, butterflies will not correspond to book descriptions as to size and colour, blackbirds are not all black, and eggs are found unlike any coloured picture. Nor does the expert help the confusion, for one man says there are ten British species (*e.g.*, Blackberries), while another describes and gives names to fifty. Many a budding naturalist finds his Gallipoli at this stage. The one who survives the ordeal has learned his first lesson, that plants and animals vary. Yet the gardener becomes familiar with this from an early stage of his career. The names of species are convenient pigeon-holes for arranging specimens, but one need not worry if specimens different in some respects must be included under one name. In natural history, as in all problems relating to grading of men, either we must be content with a few well-marked groups, or else provide a pigeon-hole for each individual. Precision is wisely recognised as essential in education, and one original sin is lack of precision. The naturalist should be precise in naming his specimens, because errors follow on bad identifications. He must be precise in making and recording his observations, for that is essential to all progress in science, but he must go further. Variability may seem a property which the systematic naturalist could do without, but if we look deeper it is variation in plants and animals that makes for progress. If all plants were as like as postage stamps, many of us would soon lose interest in them. The gardener has already learned that variation is his opportunity, and by following it up he has evolved all the useful plants of the garden and field. Before this result was achieved many experiments were made, and failures were more numerous than successes.

The gardener's work has demonstrated that while some variations may become fixed, many others are inconstant and unstable. The same is found among wild plants when careful

observations are made. The investigations of Bonnier* on the influence of alpine climate on plant form were conducted with about 100 French species, including Rock Rose (*Helianthemum vulgare*), Dandelion (*Taraxacum*), Wood Sage (*Teucrium Scorodonia*), Golden Rod (*Solidago Virga-aurea*), etc. Each species has a wide range from sea-level upwards, and the plants used for experiment were taken from localities about midway between upland and lowland. The type of plant selected was one that could be divided vegetatively, halving the rootstock of dandelion, rooting lateral branches of rock rose, etc. The two parts of each plant were grown under distinct conditions: one in a garden near Paris (about 100 feet above sea-level), the other half in one of several Alpine gardens, on the Pyrenees or on the Mont Blanc group at altitudes varying from 3,500 to 8,000 feet. After five years the plants showed marked differences in habit. The alpine plants were dwarfed, in some cases the lowland plants were ten times taller. The alpine stems were short with crowded leaves, a protective covering of hairs was frequent, and the roots and underground parts were relatively larger. Anatomical examination revealed striking differences in the tissues. The flowers were large, because they retained, with the dwarfed alpine foliage, the same size of flowers as the lowland plants. Similar differences may be found in Britain between the dwarf alpine *Thalictrum* and the larger lowland forms, the alpine *Cochlearia* and the seashore one, the alpine tussock grass and the lowland *Deschampsia caespitosa*. Bonnier's plants were collected together after some years, and grown in one garden, but they lost their distinctions and reverted, *e.g.*, Wood Sage after eight years separation and the production of marked types, reverted to the original form. The same elasticity was found by Lesage† in inland plants such as Birds-foot Trefoil, Herb Robert, and Field Convolvulus grown under seashore conditions where the leaves became smaller and thicker. Conversely seashore plants such as Sea Rocket (*Cakile*), Scurvy Grass (*Cochlearia*), etc., lost their fleshy leaves under inland conditions. Lothelier‡ produced non-spinous forms of Gorse (*Ulex*) and Rest-harrow (*Ononis*) by growing them continuously in moist air. These experiences may suffice to illustrate the gardener's experience that intensive cultivation may produce new freaks in the garden, but like a piece of stretched elastic they spring back to their original form when released.

The gardener often employs special methods, superabundance of food, or even starvation, to make a plant break the type

* Annales d. sciences nat. Botan., Ser. VII., T.XX, p. 217. Paris, 1895.

† Rev. gener. d. Botanique, II., Paris, 1890.

‡ *Idem*, XXIV., 1912.

and so reveal new variations. Abnormal nutrition may account for the origin of varieties of wild cabbage, turnip and beet. These are coastal plants, and cliffs are frequented by sea-birds, whose excrement, the guano of commerce, is rich in nitrogenous plant food, as is also decaying remains of fish. On the Faroes, C. H. Ostenfeld* states that on the shelves and below cliffs frequented by sea birds, rank-feeding weeds like chickweed, common nettle, and the annual *Poa* occur in enlarged growth-forms suggestive of rich nutrition. Here also grows the wild archangel (*Archangelica officinalis*) which is transplanted and grown in the limited gardens of these northern isles, where it is regarded as a dainty by the natives; in other parts of Europe the petioles are candied and used in confectionery. The description suggests that wild cabbage and turnip under similar conditions might assume abnormal size as regards the cabbage bud and the turnip stem-base, thus attracting the attention of some food-hunting remote ancestor. When one has seen the wild beet on a shingle beach, it is evident that these beaches must often be buried deep in seaweed cast ashore after storms. Seaweed is known to be a stimulating manure for farm crops. It would also be a favourable place for seeds germinating. In the case of beetroot, the plants growing with a liberal manuring of seaweed would be conspicuous from their large foliage and increased rootstock. We have seen Sea Kale (*Crambe*) emerging from a shingle beach on the English Channel in April, and it had the same tender foliage as that on the cultivated plant. The Sea Lavender (*Statice binervosa*) described by Salisbury† from the beach at Blakeney Point, Norfolk, has two forms, one smaller, the other with larger leaves ascribed to increased moisture or mulch action due to shingle piled up round the growing plants.

(*To be continued*).

——:o:——

On Lecturing with the Lantern is the title of an excellent address by **Prof. G. A. J. Cole, F.R.S., M.R.I.A.**, one of our most successful lecturers. It is invaluable to the beginner, and lecturers of considerable experience will find many useful hints worth their consideration. It is sold by T. H. Mason, 5 Dame Street, Dublin.

No. 15 of **The Journal of the East Africa and Uganda Natural History Society** (Longmans Green & Co., pp. 429-475, 6s. 6d.), is evidence of the continued valuable work of this society. The first paper is on 'The Geological History of the Rift Valley,' by Prof. J. W. Gregory, delivered at Nairobi in May last. There are papers on Fossorial Hymenoptera, Diseases of Stock, Prevalence of Intestinal Parasites, Nesting of Uganda birds, the Lumbwa caves, the South-east face of Mount Keruga; and several shorter notes. There are several excellent plates, some coloured.

* Botany of the Faroes, III., Copenhagen, 1908.

† *Annals of Botany*, CXVIII, 1916.

RELATIVE FREQUENCY OF SOME YORKSHIRE SYRPHIDS.

CHRIS. A. CHEETHAM.

LOOKING over a series of Platychirus and Melanostoma taken in 1919 in West Yorkshire, numbering nearly 300 individuals, some interesting species were found, four of them being additions to the county list, viz. :—

Melanostoma ambiguum Fln., 1 ♂, 24-5-19, Austwick Moss.
Platychirus fulviventris McMq., 4 ♂s, 3 ♀s, 28-6-19, ,,
P. immarginatus Ztt., 1 ♂, 1 ♀, 24-5-19, ,,
P. scambus Staeg., 1 ♂, 3 ♀s, 19-6-19, Farnley.

The last was taken by Mr. A. R. Sanderson, at Rawdon, in August, 1917, but it has not been previously recorded.

With these additions the Yorkshire list has 9 out of 15 species of Platychirus in Verrall's 2nd list, and all the four species of Melanostoma.

These dark narrow-bodied hoverers are very common, and in looking over a long series one gets an idea of the relative frequency of the various species in the district. *Syritta pipiens* L., with the thickened hind legs, may be even more frequent than the following, but it was not included, being easily identified in the field.

Melanostoma mellinum L., 21%, 3 out of 4 being ♀s.
Platychirus albimanus F., 18%, 3 out of 4 being ♀s.
P. clypeatus Mg., 15%, 5 out of 8 being ♀s.
P. peltatus Mg., 13%, sexes equal.
P. manicatus Mg., 10%, sexes equal.
Melanostoma scalare F., 10%, 5 out of 7 being ♀s, the remaining 13% being spread over 7 species; the proportion of males to females on the whole series is as 2 : 5.

One specimen of *P. peltatus* Mg. is evidently a hermaphrodite; the females all have the eyes widely separated, those of the males touching, the front tarsi of the males are enlarged and altered in shape and in this species considerably whitened. The specimen has the separated eyes of the female and the enlarged tarsi of the male, lacking only the white colouration; in Lundbeck's 'Diptera Danica,' pt. V., p. 202, a similar specimen is noted.

——: o :——

Messrs. John Wheldon & Co., 38 Great Queen Street, London, are publishing 'A Synoptical List of the Accipitres (Diurnal Birds of Prey') by H. Kirke Swann, F.Z.S., in parts, at 4/- each. Three of these have already appeared, and deal with 'Sarcorhamphus to Accipiter'; 'Erythrotriorchis to Lophoætus,' and 'Herpetotheres to Pernis,' respectively. The title of the work precisely describes its character, and there is no doubt that it will be of particular value to Museums and Naturalists interested in this class of birds.

SEX-HABITS OF THE GREAT CRESTED GREBE.

EDMUND SELOUS.

A FULLER title of these notes would be 'An Observational Diary of the Sex-habits of the Great Crested Grebe (*Podiceps cristatus*) during the first three weeks after its arrival in inland waters: with a theory of the origin of "head-shaking," in this species, and of the evolution of Darwinian sexual selection out of some earlier phases of monogamous erotic display action.' They were made by me, except for some subsequent elaboration of the theoretical matter, from February 5th to March 7th* of 1915, on the Tring Reservoirs, more especially that one which is close to the secluded little village of Wilston, in Hertfordshire. At that time, so far as I know, the so-called pairing-up habits of the Great Crested Grebe had not been recorded, nor am I aware that they have, since. My observations, I think, go to show that, insofar as this term implies a new choice of mates on the part of previously mated birds, from year to year, as distinct from a first choice, of which, so far as I could judge, I saw nothing, such habits do not exist—at least from the time when they first reach their inland breeding-waters. In a quite minor degree, some other species are included in these notes, and so far as I was able, I compared the habits of the Dabchick, at this period, with those of the principal subject of them. The latter is always intended to be designated when the word Grebe, without further qualification, is used.

FEB. 15TH TO 17TH.—Got here ('here' is a little village, or something less than that, called Startopsend, beside one of the reservoirs) on Monday afternoon—the 15th. Only two of the Grebes, I was told by the keeper at whose cottage I stayed, had yet been seen, but next day, the head keeper sent word that there were six on Wilston Reservoir,† about three quarters of a mile away. I had arrived with a bad cold, which, on the day after this announcement, attained its zenith, so that I was not able to get out till the afternoon. I saw one Grebe swimming on the water almost adjoining my cottage, but, beyond this, there was nothing to interest.

* More strictly to February 25th, and again from March 1st, as there were three blank days owing to my not being well. But nothing essential could by this time have been missed.

† The coldness of this early spring—I often sat with snow all around me—may have made the birds late in arriving, yet it appeared from a letter which I had from the head-keeper, advising me as to time of coming, that they were not expected earlier. This, however, is according to my memory, as I have lost the letter. The statements made in regard to their first appearance were positive and stand in harmony with their numbers. The point is an important one.

FEB. 18TH.—To-day, the keeper took me round about the reservoirs, both here and at Wilston, pointing out some places of espial, which, however, did not afterwards become mine, in any special degree. Wilston Reservoir is a larger piece of water than any of the three here—much larger than the two nearest, which lie close together, to the two boathouses on the further one of which I have now been introduced—but we only saw one solitary Grebe upon it.

Got back about mid-day, and, an hour or two later, went out by myself, and, making again for these boathouses, let myself into one of them (a key having been granted me), and sitting down in one of two very large punts which it contained, began to watch seriously for the first time since my arrival. The quarry, however, if the term be here permissible (though I hope it is not), was not the Great Crested Grebe, but only its little brother, the Dabchick, A belt of reeds, now sere and yellow, runs along a considerable extent of the banks of this reservoir, the space of water thus enclosed making a quiet little pool, which takes in these boathouses on either side of which the reeds become thicker and denser. Dabchicks haunt this pool, to the number, I think, of a dozen, or thereabouts, though I only saw seven, at one time, together. These birds, as yet, showed no signs of nuptial activities, yet it struck me, rightly or wrongly, that though still congregated or liable to congregate, they were, for all that, paired. Two, at any rate, would often swim together, or, if separated, make for one another, and I judged by their manner that these were male and female. A part of the narrow fringe of reeds, just opposite me, was used as a retiring-place by the little birds, into and out of which they swam at intervals, and watching them thus acting, one seemed to see the two tendencies to flock and to pair, both at work. Now and again, they dived for food, and twice I saw one come to the surface with weed, which it swallowed. There are some Coots in the pool, too, perhaps half a dozen, and I noted that, at one particular point of the reeds, one of these birds was several times driven out from them, into the open water, by another, which suggests that a nesting territory has already been claimed by the latter. This reservoir also harbours a fair number of Ducks, mostly Tufted Ducks, but also some Red-headed Pochards and others, and as the afternoon declined into the evening, some of these swam into the pool, giving me a fine view of them.

Now occurred my most interesting observation. Quite suddenly an excitement seemed to come over these Ducks. They pressed together, and swam fast out of the little bay of the boathouses, till, joining some others just beyond it, they flew over to the farther side of the water, and swam, all one

way, along the belt of reeds fringing it. In this excitement the Dabchicks and Coots seemed to share, several—and then another several—of the former flying suddenly over the water, in the same direction as the Ducks were swimming, and diving, as they came down upon it. I cannot so well remember the exact way in which the Coots showed that they, too, were touched, but the feeling seemed to me to be pervasive, and to embrace every bird on the water, of which I was cognisant. I looked at my watch (four minutes to four) and as I did so, all the Ducks—Tufted, Pochards, etc.—now packed closely together, came swimming back, in the opposite direction, along the belt of reeds, then out into the middle of the water, and, in a moment, all rising together, they flew away, leaving the reservoir empty of their tribe. I looked at my watch again—it was one minute to four. So marked and sudden had been the manifestation that, at first, I thought some disturbing (most probably human) influence had obtruded itself, but of this there was no sign. After the flight, not a duck was to be seen on the water, for some time, and then a single Tufted one flew back to it. The Coots and Dabchicks, though they had shared in the wave of emotion preceding the flight, did not take part in it, but settled down, again, into the ordinary train of their activities.

FEB. 19TH.—The plague of letters kept me in till three. I then walked to the boathouses, meaning to watch from them, as yesterday, but was diverted from this project by finding two Crested Grebes down upon the closely adjoining, more open piece of water, on the other side of the path between the two smaller reservoirs. I watched these birds carefully, for a considerable time, during which, and long before I went, it became absolutely clear that they were a mated pair. One was considerably larger than the other, with the ruff more developed. For a good time, they were apart on the water, and separated by a wide interval. Then the female swam, in a continuous straight line, to the male, passed some way beyond him, paused and dawdled till he had caught up to her, and from this point, they remained in a more or less close proximity, and exhibited every sign of being on a conjugal footing, compatible with the absence of special sexual activities. The male, for instance, often floated somnolent, if not actually asleep, with his head drawn back to the middle of his back (the pork-pie attitude), whilst the female moved, quietly, near and round about him, quite Darby and Joan, and that they were so was beyond question. Having established this point, I walked on, to the large sheet of water, at Wilston, and then about three quarters round it. Early in this perigrination, the glasses showed me another pair of these Grebes, swimming at close quarters, also pretty obviously a mated

pair. Their facial ornateness was less developed than in the male of the other pair, so that they presented more the appearance of a larger and smaller female, but the conjugal spirit was sufficiently marked in them, and it would not, I think, be usual for two females thus to consort, and, whilst together, to give this impression. Opposite the furthest point to which I got, were a number of Ducks, and, amongst them, four Grebes. These gave occasional, but less unequivocal, signs of being two mated pairs, but after all four had swum out from the flock of Ducks, on to the clear expanse of the lake, they at least showed a tendency, now and again, to separate into couples, and one, having returned alone, was joined, some time afterwards, by another, after which the remaining two came back together, but not closely so. Swimming after these, however, appeared a fifth, nor was I able to discover a partner for this one. The second pair, having re-associated themselves with the Ducks, drew up close together, whilst the first-mentioned made some mutual motions with the head, which seemed to me like the faint beginnings or forerunners of Huxley's 'bouts of shakings.'

Here, too, then, the evidence is fairly good that four out of these five birds represented mated couples, making four such, to-day, in all, as seen by me. Yet these Grebes have only lately come, so that the influence is that they arrive paired. If they do, they must either remain so through the winter, which is what I am inclined to think, or 'pairing-up' may take place at sea, and not on these inland breeding-waters. Such a separation, however, between the place and the activities proper to it, is not what one would expect, and, least of all, with birds whose actual pairing-place is the nest itself.

Feb. 20th.—Saw two pairs of mated Grebes, to-day. This was obvious from their actions and general deportment, though often each pair would get a good deal separated. Not only were they mated, however, but in spite of the earliness of the season and Huxley's account, as reported to him by the head keeper of these reservoirs, of these birds' habits at this time,* love-actions were already to be observed amongst them. More than once I felt sure that nebbing was taking place, but, unfortunately, the distance was too great to let me be quite certain. This was with a pair on the Wilston reservoir, but on my return, towards evening, I watched, for a little,

* 'About the first week in February they leave the sea-coast and fly back, in bands, to the inland waters where they breed. They live in flocks for about three weeks, and then start pairing up. Pairing up lasts altogether about a fortnight, bringing us to mid March.' (*Proc. Zoological Society*, 1914, Vol. II., p. 495). What I saw and what was to be inferred, was all very different from this. The birds flew back married, and began shortly to rejuvenate into engaged couples.

from the boathouse, on one of those near at hand, and here were a pair with whom things were still further advanced. First these birds fronted each other, quite close together, and shook their heads, several times, much as Huxley has described, but to nothing like the extent sometimes witnessed by him. The movement was brisk and alert, yet with something about it which gave the idea of incompleteness. It seemed to me to have the character of a preliminary to something else, as though the birds had, each time, shaken their heads before doing something, which they did not do. What was this undone thing? To me it was suggested that, each time, they were on the point of nebbing, but gave a nervous preliminary shake of the head, or rather one which should have been and was, at one time, preliminary, but by being repeated and then again repeated, with the other still to follow, but still put off, has, at last, usurped the place of what was once the important matter, and became a stereotyped nervous action—a prologue that has gradually ousted the play. But this was not all, for when this performance was over, the two birds made for the reeds, one following the other. I could not see them plainly behind this screen, the distance being also considerable. Yet it was but a scant one, and, all at once, fronting and well-nigh touching one another, they both of them assumed such a tallness as made it evident that they were standing upright in the water, and, at the same time, I plainly saw that each had a fat lump of weed, held firmly in the mandibles, from which the end dangled down. They appeared to me to be making gulps or gulping bites at this weed, but, hard as I tried to, I was unable to see whether they swallowed it, or any part of it, before sinking down into their normal attitude again. From what has gone before, however, as well here as in my former observations, both on this species* and the Horned Grebe,† which I have watched more recently in Iceland, I feel sure that the original impulse, in seizing the weed, was not a gustatory one. It is, as it appears to me, and at this season, a premature act of nest-building, which, at a later period, is directly followed by a desire of pairing, on the nest (then made, or in course of construction); a desire which issues either in actual performance, or, at the least, in some preliminary steps towards it. It may, therefore, as I have suggested, be a piece of unconscious or half-conscious symbolism, but if it be asked why the thoughts of birds should pass, by a quick transition, from preoccupations which are clearly sexual, to something so unlike this as the mechanical impulse of architecture, alone, must

* *Zool.*, September, 1901, pp. 343-45.
† *Zool.*, June, 1914, pp. 213-14.

be admitted to be, I have myself no other explanation to offer than that to which my own observations have led me, namely, that the nest-building activities have, themselves, developed out of those purely sexual ones which—originally nervous, merely, and unpurposive—have, under the guidance of sexual selection, also produced those of sexual display. Thus, by association of feeling, any one of these impulses may pass, with the actions appropriate to the transition, into either of the others. Leaving theory, however, we have the actual fact that on this 20th of February, some few days only after arrival on their inland waters, two of these birds went through some of the essential love, and also nest-building, actions of a mated pair, as elsewhere recorded, both by myself and Huxley, at a later—the true nest-building—period.*

——: o :——

Dr. F. A. Lees has been elected Honorary Life Member of the Leeds Naturalists' Club.

The Annual Meeting of the Selby Scientific Society was held on January 22nd. The report of the work done in the year was presented by the Secretary, Mr. J. F. Musham, and recorded a net gain of 23 on the year, and a total membership of 150. Reference was made to the very successful gathering of the Yorkshire Photographic Union in June, when the society entertained about 120 visitors from all parts of the county. The black-headed gull was present in greater numbers on Skipwith Common than for several years past, and several pairs of shoveller ducks had been observed to rear their broods. Additions to the plant records had been made by Messrs. J. B. Foggitt and J. F. Musham. The photographic section had done excellent work. Mr. W. Y. Rumfitt presented the treasurer's report, which shewed an improved balance. Mr. C. H. March was appointed president for the ensuing year. The secretary and treasurer were re-elected with acclamation. Votes of thanks were accorded to the retiring president, Mr. J. H. Brook, to the committee and others.

The annual meeting of Halifax Scientific Society was held on February 4th, presided over by Mr. H. Waterworth. There was a large attendance. Mr. J. H. Lumb, secretary, read the 46th annual report, which recorded a membership of 198, compared with 181 at the end of the previous year. The natural history section had a membership of 30, the circle of microscopy 17, and the photographic section 32. The average attendance at the public lectures was 99. The committee expressed appreciation of the long and valued services of Mr. Waterworth, and wished him many years of health and happiness in his retirement from the teaching profession. Miss Piercey, treasurer, reported a balance in hand of £5 11s. Officers were elected as follows :—President, Mr. H. Waterworth ; vice-presidents, Messrs. J. A. Wade, F. Barker, J. H. Bolton, W. B. Crump, H. P. Kendall, S. Sugden, S. Tidswell, R. H. Hayhurst and J. W. Sutcliffe ; secretaries, Messrs. J. H. Lumb and H. E. Greenwood ; treasurer, Miss Piercey. Members of the different sections of the Society had exhibits of their work and collections. Among these were several exhibits connected with the war, in which Halifax men had participated, and Mr. R. Rothwell showed micro sections of Coal Measure plants.

---

* *Zool.*, September, 1901, pp. 343-5 ; *Proc. Zoological Society*, 1914, Vol. II., pp. 514-15, Pl. 2, Fig. 13.

BIRDS OF THE EASTBY DISTRICT, YORKSHIRE.*

W. ROWAN, B.Sc., M.B.O.U., WINNIPEG.

THE area involved roughly includes the triangle formed with Barden, Thorpe Fell, and Crookrise Wood as the corners; also the little bit of Wharfedale from Bolton Abbey to Barden. The writer was living at Eastby Sanatorium, four miles North-east of Skipton, on the edge of Embsay Moor, and nearly 1000 feet above sea level.

Carrion Crow.—Resident. Fairly abundant despite constant persecution. Certain woods, *e.g.*, the larger Moor Lane Plantation are tenanted year after year. In this wood both birds of a pair have been shot for several years in succession, yet the wood again held a pair this year. Laying began in about the third week of April.

Jackdaw.—Resident and abundant. Seldom seen on the moors. Nesting in large numbers in the Skipton Rock Quarry and Skipton Castle. When the young were flying in late July and August they far outnumbered the Rooks in Skipton. Laying (at Skipton Rock) began about the 1st May.

Rook.—Resident. Owing to shooting during the war has decreased considerably and several old rookeries are now abandoned. In those still used are a number of untenanted nests, *e.g.*, Embsay Kirk, Halton East and Skipton Castle Rookeries.

Magpie.—Resident. A few pairs still nest here and there, despite steady war on the race. Laying began last week April.

Jay.—Exterminated in this area by keepers, though formerly abundant, particularly at Barden.

Starling.—Resident in the villages. Nesting freely in most of the moorland quarries and crags. First bird seen in the Sanatorium grounds 14th March. Frequenting Halton Moor Quarry and the crags from mid-April. Laying from last week of that month.

Greenfinch.—Resident. Common, nesting in most of the woods. Very abundant Embsay and Halton. Laying from last week April.

Hawfinch.—Confined to Wharfedale, where resident. A few pairs nest annually at Bolton Abbey and above; saw young being fed in neighbourhood of Bolton Hall on July 3rd.

House Sparrow.—Resident. Only a single nest at the Sanatorium. Quite outnumbered by several other species even at Embsay. Laying from second week May.

* Observed between 19th January and 5th August, 1918.

Tree Sparrow.—A pair frequented the Kirk corner at Embsay throughout May and June. In the last part of the latter month they were feeding young.

Chaffinch.—The commonest bird in the district. Sometimes, particularly in Wharfedale, the whole place seemed alive with them. Not one around the Sanatorium till the 15th March when they turned up in numbers in the early morning and remained thence onwards. Laying from the second week May.

Linnet.—Thinly distributed on suitable spots on the moors.

Lesser Redpoll.—Thinly distributed Halton East and Wharfedale. Seen in Sanatorium grounds 14th March.

Twite.—Only passing through in March. Seen also February 19th outside Skipton ; 8th May near Tewit Bogs ; on moors first days of August. Breeds on a not distant moor.

Bullfinch.—Thinly distributed Wharfedale and some of the higher woods, *e.g.*, Nelly Park.

Sky-lark.—Resident and common. Not frequent on the moors, but very abundant on grassy areas such as the Stank. Laying from second week May.

White Wagtail.—Seen twice near Nelly Park in May. Also on Eastby Crag where young were reared and a second clutch laid. The cock was beyond doubt a White and the hen as certainly as it is possible to say without having handled the bird. The pair were under close observation for weeks.

Pied Wagtail.—Common, but not resident. The first birds appeared in the grounds on the 11th March, thence onwards increasing, and in a few days plentiful. From end of April to mid-May 50 to 60 could be put out any evening from the Rhododendron bushes where they roosted. They used to foregather on the crag and then come down to roost more or less in a body. Laying mid-May (though possibly a few considerably earlier). Second broods the rule.

Grey Wagtail.—Non-resident and not frequent. Several pairs in Wharfedale where two broods the rule. One pair probably bred above the Low Dock on Barden Beck. First bird reported from Wharfedale 19th February. First seen on moorland streams (Ramm's Gill), 24th February.

Yellow Wagtail.—Abundant in meadows in vale and Wharfedale. Two pairs at least nested at the Low Dock. Two broods the rule. Arrival the first week May.

Tree Pipit.—Very abundant in the neighbourhood of all woods. Even on the moors wherever a few trees occurred, *e.g.*, by the gate of the High Dock. Arrival first, laying third week May.

Meadow Pipit.—Abundant on all the moors and to a lesser degree in the vale. Resident, though scarce on the moors in winter. Laying from second week May.

Water Pipit.—Almost certainly seen 22nd January. (*See* note at end.)

Tree Creeper.—A pair noted in Sheltercliff Wood, 23rd March, but it must have gone off for it was not seen again, though a bit of egg-shell possibly belonging to this species was found in May.

Great Tit.—Resident and common Wharfedale. Noted Sheltercliff Wood, 14th February.

Coal Tit.—Resident, but not plentiful, Wharfedale. Nests sparingly right up to the moors in suitable woods.

Marsh Tit.—Family of six or seven seen Barden, 8th July.

Blue Tit.—Resident and plentiful right up to the moors.

Whitethroat.—Fairly common in Wharfedale.

Lesser Whitethroat.—Seen near Strid, 25th June, and in Skipton Castle Woods, June 20th.

Garden Warbler, Black Cap.—Both species thinly distributed in Wharfedale.

Grasshopper Warbler.—Nested in vicinity of Low Dock last year.

Willow Warbler.—Abundant right up to the moors. Arrival last week April. Laying third week May. Somewhat earlier in the vale.

Wood Warbler.—Abundant right up to the moors. Every spinney has its pair. Sheltercliff had a pair at each end. Arrival second week May, Bolton Woods ; last week May, round Moors. Laying Bolton, mid-May.

Chiff-chaff.—Heard only once at Strid, on April 14th. It was no doubt merely passing through the district. Practically unknown here.

Mistle Thrush.—Resident, increasing for breeding season. Sheltercliff held five or six pairs. Laying in Wharfedale end of March. A week later around the Sanatorium.

Song Thrush.—Absent at Sanatorium in winter. Nesting commonly in all the woods. The most favourite site is the lateral branch of some coniferous tree, usually about ten feet up, sometimes up to 45 feet. Occasionally in a stone wall. At Bolton (Deer Park) one nest on the ground (Tomlinson). The birds began turning up at the Sanatorium in numbers first days of March. Laying end of month.

Redwing.—Scarce throughout winter. Occasionally in some numbers and with Fieldfares. Last seen end of April.

Fieldfare.—Seen periodically January-May, always on Halton Moor and Heights. They roosted nightly in the larger Moor Lane Plantation. Last seen 9th May.

Blackbird.—Resident and common. Nests found in the following sites—on the ground, in root of fallen tree, in cavities of tree trunks, on a rafter in a shed, on the face of a cliff (Ramm's Gill), high up spruce trees, in stone walls.

The last two were favourite situations. Laying began as March went out.

Ring Ouzel.—On an average a nest every quarter of a mile on suitable ground. The presence of water was no particular attraction, though ling was. About eighteen nests were found within a semi-circle of one and a half mile radius round the Sanatorium. Birds arrived 8th April. (Reported Barden Fell, 1st April). Laying began third week April. Some at all events had second broods, mid-June.

Redstart.—Well distributed and fairly plentiful. All nests found but one were in stone walls. The odd nest was in Shelterclift Wood in a tree. First arrival, 18th April. Main arrival at close of month. Laying from third week May.

Redbreast.—Resident, but not common round the moors. Abundant in valley of Wharfe.

Stonechat.—Occasional. One reported by Birch on Barden Moor in April. This name is commonly applied here to the Wheatear, but Birch was aware of this and the identification is no doubt sound.

Whinchat.—Several pairs on Barden Moor and in rough pasture by Low Dock and an odd pair or two elsewhere. Laying end of May.

(*To be continued*).

——: o :——

Cumberland Hemiptera.—One afternoon last September, wishing to obtain a few specimens of the common Thistle Bug (*Monanthia cardui* Linn.), I went to a known habitat in the Caldew Valley, near Carlisle. The day was somewhat windy, and in the process of tapping the host plant (*Carduus nutans*) over my beating sheet, many ripe seeds were knocked down, as well as the insects. In several instances I saw the Bug fall with, or climb on to the seed, which was carried away by the wind. Thus was the plant assisting in the dispersal of the insect.—Jas. Murray, 2 Balfour Road, Carlisle.

—: o :—

Crossbills in East Yorks.—On 23rd November, 1919, I had a report of a small party of Crossbills in Ferriby, seen on the highroad, but as I could get no confirmation, and my informant did not know the birds, but merely said they had a bright crimson patch above the tail, I did not think that the identification was sufficiently reliable. However, on 21st January a male Crossbill was shot by a boy with an airgun in a small Larch Spinney on the Brough Golf Links. It was one of a party of about twelve, which was feeding on the Larch cones, hanging head downwards in characteristic attitudes, and astonishingly tame.—E. W. Wade.

FIELD NOTES.

BIRDS.

Old Yorkshire Bird Records.—The late Ven. Archdeacon W. B. Stonehouse, D.D., wrote a *History of the Isle of Axholme,* London, 1839. On page 68 he refers to a former decoy, now buried below warp (or Estuarine-Alluvium), about a mile from the village of Crowle. This spot was geographically in the county of York, though I was told in 1874, the fowl from it flighted nightly over Lincolnshire to feed on the Humber marshes. This decoy and the quaking bog round it was famous in the early forties of last century for *Scheuchzeria palustris* abounding there. It stretched over a wide area of turf pits in spongy bog 'almost up to the carr edge' which was situated in Lincolnshire. *I now find,* according to the late Dr. Ellis, of Crowle, this decoy was about a mile from Crowle Church, and was the spot where the late Rev. J. K. Miller, of Walkeringham, Notts., (*See The Naturalist,* 1895, p. 170), took *S. palustris,* on 16/7/1840. He says, 'most abundant at a little pool nearest to the decoy, but found in others too.' Now these 'other pools,' were I find on the edge of the carr, which in summer was a little drier than the neighbourhood of the decoy which was quaking bog. They were formed by the Crowle people cutting turves in former seasons. The bird list as given by the Archdeacon from sight are :—Wild Geese, species not named, Wild Duck, Mallard (*i.e.,* the male of the last, decoymen always distinguish them), Scaup-Duck, Sheld Duck, Pintail-Duck, Swallow-tailed Duck (*i.e.,* our local name for *Harelda glacialis,* L.), and Pochard. To this list I can add, referring wholly to the Yorkshire side of the county boundary, in every case. Early in the nineteenth century the White-tailed Eagle haunted this spot, as well as the Trent and Ancholme marshes. (*See* the late Sir Charles Anderson's *Short Guide to Lincolnshire,* Gainsborough, 1847, where this bird is recorded). Later still a Golden Eagle was seen, and finally shot at Normanby Park, Lincolnshire, 1/11/1881. Also as late as the early 'seventies the Garganey attempted to breed by one of the moor pools, the Twite did so, and about 1876 a Ruddy Sheld-Duck was seen too. I have seen what I now know to have been the Peregrine Falcon quartering the ground in the same area.—E. Adrian Woodruffe-Peacock. Grayingham Rectory, Kirton-in-Lindsey.

——: o :——

From our friend, Mr. T. Petch, B.A., B.Sc., we have received the following interesting papers :—'Gasteromycetae Zeylanicae,' 'Revisions of Ceylon Fungi, (Part VI.),' 'Further notes on *Colus Gardneri* (Berk.) Fischer,' 'A New Variety of *Exacum zeylanicum* Roxb.,' 'Oxalis in Ceylon,' and '*Alocasia indica* Schott.'

BIBLIOGRAPHY :

Papers and Records relating to the Geology and Palaeontology of the North of England (Yorkshire excepted), published during 1919.

T. SHEPPARD, M.SC., F.G.S.

(*Continued from page 71*).

J. WILFRID JACKSON. Derbyshire.

On the Occurrence of Productus humerosus (=sublaevis) in Dove Dale, and its value as a Zone-Fossil. *Geol. Mag.*, Nov., pp. 507-509.

J. WILFRID JACKSON. Lancashire, Yorkshire.

On a New Middle Carboniferous Nautiloid (Coelonautilus trapezoidalis). *Mem. and Proc. Manchester Lit. and Phil. Soc.*, Vol. LXIII., pt. 1, pp. 1-4 ; abstract in *Nature*, March 6th, p. 181.

J. WILFRID JACKSON and W. E. ATKINS. Derbyshire.

On the Discovery of a Quartzose Conglomerate at Caldon Low, Staffs. *Geol. Mag.*, February, pp. 59-64.

J. WILFRID JACKSON, HILDA K. BRADE-BIRKS and S. GRAHAM BRADE-BIRKS. Lancashire S.

Notes on Myriopoda, XIX. A Revision of some Fossil Material from Sparth Bottoms, Lancashire. *Geol. Mag.*, September, pp. 406-411. Reprinted as 'Notes from the Manchester Museum, No. 25.'

T. A. JONES. Lancashire.

Liverpool Geological Society [Report of excursions to Gateacre and Knowsley Park]. *Lancs. and Cheshire Nat.*, September, pp. 82-83.

T. A. JONES. Lancashire.

Liverpool Geological Society [Report of excursion to Rainhill]. *Lancs. and Cheshire Nat.*, October, p. 119.

T. A. JONES. Lancashire and Cheshire.

Liverpool Geological Society [reports of lectures by J. C. M. Given on 'The Divisions of the Pleistocene' and by W. Hewitt on 'The Contribution of a local Geological Society to a Regional Survey' and 'Marl and Marling in Cheshire.' *Lancs. and Cheshire Nat.*, December, pp. 174-175].

PERCY FRY KENDALL. Northern Counties.

On 'Wash-outs' in Coal-seams and the Effects of Contemporary Earthquakes. *Abs. Proc. Geol. Soc.*, pp. 28-31 ; abstract in *Geol. Mag.*, March, pp. 133-136, *The Naturalist*, February, pp. 51-53, *Nature*, January 30th, p. 437, and *Phil. Mag.*, October, pp. 496-499.

G. W. LAMPLUGH. See under CHARLES TAYLOR TRECHMANN.

F. T. MAIDWELL. Lancashire S., Cheshire.

Some Borings through the Marshes bordering the Southern Shore of the Mersey Estuary [abstract] *Geol. Mag.*, April, pp. 187-188 ; also *Lancs. and Cheshire Naturalist*, December, 1918 [published March, 1919], p. 252.

ERNEST R. MATTHEWS. See BRYSSON CUNNINGHAM.

J. L. Maxim. Lancashire S.

Discovery of a Bloomery at Birches, Healey. *Trans. Rochdale Lit. and Sci. Soc.*, Vol. XIII., pp. 94-99.

James Morrison. Lake District.

The Shap Minor Intrusions. *Quart. Journ. Geol. Soc.*, Vol. LXXIV., pt. 2, July, pp. 116-144.

W. R. Ormandy. See E. H. Cunningham-Craig.

F. M. Perkin. See E. H. Cunningham-Craig.

H. Preston. Lincolnshire.

Geological Report, 1918. *Lincs. Nat. Union Trans.* for 1918, pp. 115-116.

J. Pringle. Lincolnshire.

Palaeontoiogical Notes on the Donnington Borehole of 1917. [Appendix III. to Summary of Progress of Geological Survey for 1918, pp. 50-52].

R. H. Rastall. Lincs., Yorks., etc.

[Review of] **The Jurassic Ironstones of the United Kingdom ; and Average Analyses of British Iron Ores by F. H. Hatch** [see under Hatch, 1918]. *Geol. Mag.*, January, pp. 38-39.

R. H. R[astall]. Northern Counties.

Special Reports . . . Vol. VII., Lignites, Jets, Kimmeridge Oil-Shale, Mineral Oil, Cannel Coals, Natural Gas, Part I.: England and Wales, by A. Strahan, 1918 [review of]. *Geol. Mag.*, May, pp. 231-232.

R. H. R[astall]. See G. Hickling.

W. Alfred Richardson. Notts., Lincs.

On the origin of Septarian Structure. *Mineral Mag.*, Vol. XVIII., No. 86, May, pp. 327-338.

W. I. Robinson. Northern Counties.

The Relationship of the Tetracoralla to the Hexacoralla. *Trans. Connecticut Acad. Arts and Sci.*, Vol. XXI., February, 1917, (received December, 1919), pp. 145-200.

A. H. Seabrook. See E. H. Cunningham-Craig.

J. H. Sequeira. See B. Blount.

T. Sheppard. Northern Counties.

Papers and Records relating to the Geology and Palaeontology of the North of England (Yorkshire excepted), published during 1918. *The Naturalist*, March, pp. 97-101, April, pp. 141-142.

T. S[heppard]. Lincolnshire, Yorkshire.

In Memoriam : H. C. Drake, F.G.S. (1863-1918). *The Naturalist*, March, pp. 107-109 ; also in *Geol. Mag.*, March, p. 144.

R. L. Sherlock. See T. C. Cantrill.

THEODORE SINGTON. Derbyshire.

The Search for Petroleum in Derbyshire now in progress. *Trans. Manch. Geol. and Min. Soc.*, Vol. XXXVI., pt. 3, pp. 67-78.

BERNARD SMITH. Durham, Notts., Lake District.

The Chellaston Gypsum Breccia in its Relation to the Gypsum-Andydrite Deposits of Britain. *Quart. Journ. Geol. Soc.*, Vol. LXXIV., pt. 3, pp. 174-203.

BERNARD SMITH. Lake District, etc.

Haematites of West Cumberland, Lancashire, and the Lake District. [*Geol. Survey Mem.*], pp. iv. + 182. See review in *Nature*, January 1st, 1920, pp. 429-431.

G. F. H. S[MITH]. Northern Counties.

Charles Otto Trechmann [Obituary Notice]. *Min. Mag.*, Vol. XVIII., No. 87, November, pp. 398-399.

J. T. STOBBS. Durham.

Recent Papers on the Durham Coalfield. *Geol. Mag.*, August, pp. 334-335.

J. T. STOBBS. See J. B. ATKINSON.

GILBERT STONE. Northern Counties.

The British Coal Industry, London, 188 pp.

A. STRAHAN. Northern Counties.

Summary of Progress of the Geological Survey of Great Britain and the Museum of Practical Geology for 1918 [with appendices by J. Pringle, G. W. Lamplugh, and others], 76 pp.

A. STRAHAN. See R. H. R[ASTALL].

JETHRO J. H. TEALL. Cheviots.

The Evolution of Igneous Rocks. *Proc. Bournmouth Nat. Sci. Soc.*, Vol. X., pp. 73-77.

CHARLES TAYLOR TRECHMANN. Durham, Yorkshire.

On a Bed of Interglacial Loess and some Pre-Glacial Freshwater Clays on the Durham Coast. *Abs. Proc. Geol. Soc.*, pp. 22-25; *Nature*, January 9th, p. 379; *Geol. Mag.*, February, pp. 89-91. *The Naturalist* [with discussion by G. W. Lamplugh], February, pp. 54-55.

C. T. TRECHMANN and D. WOOLACOTT. Durham, Notts., Yorks.

On the Highest Coal-Measures or 'Zone' of Anthracomya Phillipsi in the Durham Coalfield. *Geol. Mag.*, May, pp. 203-211.

ARTHUR ELIJAH TRUEMAN. Lincolnshire, Yorkshire.

The Evolution of the Liparoceratidae. *Quart. Journ. Geol. Soc.*, Vol. LXXIV., pt. 4, pp. 247-298.

E. J. TWIGG. See R. T. WILSON.

G. W. Tyrrell. Lake District, Notts.

Geology [Recent Papers]. *Science Progress*, October, pp. 217-224.

Albert Wilmore. See Wheelton Hind.

J. N. Wilson. Derbyshire.

The Largest Quarried Block. *Quarry*, July, p. 196. See also *The Naturalist*, August, p. 273.

R. T. Wilson and E. J. Twigg. Northern Counties.

Industrial Sheffield and Rotherham, 355 pp.

Henry Woods. Northern Counties.

Palaeontology Invertebrate, 5th edition, pp. viii+412.

David Woolacott. Northumberland, Durham.

On Sections in the Lower Permian Rocks at Claxheugh and Down Hill, Co. Durham [notice of. See 1918 list]. *Geol. Mag.*, April, pp. 185-186.

David Woolacott. Durham.

On Borings at Cotefield Close and Sheraton, Co. Durham (Permian and Coal Measures). *Geol. Mag.*, April, pp. 163-170.

David Woolacott. Lake Dist., Durham, Lincs. N., Yorks.

The Magnesian Limestone of Durham. *Geol. Mag.*, October, pp. 452-465 ; November, pp. 485-498.

David Woolacott. Durham.

Recent Papers on the Durham Coalfield. *Geol. Mag.*, October, pp. 479-480.

David Woolacott. Northumberland, Durham.

The Physiography and Geology of Penshaw Hill and District. *The Vasculum*, Vol. V., Nos. 1 and 2, pp. 117-121.

D. Woolacott. See C. T. Trechmann.

—: o :—

At a recent meeting of the Linnean Society the Secretary, Mr. B. Daydon Jackson, gave a lecture entitled ' Methods of Botanic Illustration during Four Centuries.'

We learn from the press that the late Thos. Boynton, F.S.A., of Bridlington, left £75,689. ' The authorities of the British Museum have for years kept in touch with him, the specimens of furniture, especially the oaken chests and china with which his house was stored, were of surpassing interest and great value. He expressed the desire that the executors should give to the British Museum certain of his articles of English Pottery which he intended to enumerate in codicil.' No such list is, however, attached to the will. We understand that the authorities at the British Museum have been permitted to select some of the objects, and also that the museums at York and Hull have benefitted.

NEWS FROM THE MAGAZINES.

The price of *Nature* has been increased to 1s. weekly.

Mr. W. G. Sheldon writes on the Life-Cycle of *Lobesia permixtana* in *The Entomologist* for February.

The Geological Society of London has awarded the Murchison fund to Dr. D. Woolacott, whose work is familiar to our readers.

In *The Entomologist's Monthly Magazine* for February, Mr. G. T. Porritt has a note on the Abundance of *Exapate congelatella* Clerck at Huddersfield.

Dr. P. Chalmers Mitchell, Secretary of the Zoological Society, and a member of the staff of *The Times*, was the scientific observer on the first flight from Cairo to the Cape by air, early in February.

In an article in *Nature* for January 22nd, on 'The Microscopy of Metals,' 'C.H.D.' pays tribute to the pioneer work of the late Henry Clifton Sorby and reviews the progress our greatest Yorkshire scientist made from time to time with regard to sections of rocks, ores and metals.

The Journal of Conchology for January contains Mr. E. Collier's presidential address 'Reminiscences and Practical Hints on Collecting'; 'Notes on the anatomy and reproduction of *Paludestrina jenkinsi*,' by Captain H. E. Quick, and 'The Marine Mollusca of Sussex,' by Mr. R. Winckworth, the latter including some new records for the county.

Mr. H. F. Witherby gives a summary of his Bird Marking scheme in *British Birds* for February. No fewer than 91,162 birds have been 'ringed' between the years 1909 and 1919. In 1909 the number was slightly over 2000 and gradually increased until 1913 when nearly 15,000 were dealt with. From that date the numbers have gradually decreased until last year it was 3,578.

In a paper on the occurrence of humanly-fashioned flints in the Middle Glacial Gravels at Ipswich, in *The Journal of the Royal Anthropological Institute*, the author states 'The occurrence of flint implements of early Chellean form in a gravel *presumably* more ancient than the Glacial Chalky Boulder Clay will no doubt come as a surprise to many archæologists.' It won't; we quite expect the remains of Adam and Eve will be recorded there soon.

The Detmold Nature Pictures (J. M. Dent & Co.,). A magnificent Series of Twenty-four Nature Studies drawn from Life by E. J. Detmold, the well known artist. The twenty-four plates have been beautifully reproduced in full colours, each unmounted plate measuring 15 ins. by 10 ins. The mounted plate measures 20 ins. by 15 ins. The price of the set (in portfolio) is £5 5s. The studies are principally birds, though there are a few mammals and two of marine crustaceans, etc. Of the few we have seen we must say we prefer the pictures of birds to the 'Dormice,' which, though excellently drawn and reproduced, contains too much detail. The drawings would make fine pictures for hanging in schools.

On the 20th February, the long and meritorious connexion of Mr. R. B. Newton, with the British Museum of Natural History, came to an end. Transferred in 1880 from the Museum of Geology, Mr. Newton has had 42 years of Public service, during which long period numbers have repeatedly been indebted to his friendly help and assistance. He has our best thanks and wishes. It is, of course, too much to hope that the vacancy thus created, has been foreseen by the Three Principal Trustees, or that they have taken any steps to fill it. Mr. Crick died in October, 1917, and since that date no one with special knowledge has been in charge of the fossil Cephalopoda. If, therefore, the same neglect of official business is shown on this occasion, it will very soon be useless to waste time seeking information as to the fossil Mollusca at all from the Natural History Museum.

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
Mar. 1st, 1920.

APRIL 1920. No. 759
(*No. 533 of current Series*).

THE NATURALIST.

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

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;
AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, D.Sc., F.R.S., F.L.S. G. T. PORRITT, F.L.S., F.E.S.
Prof. P. F. KENDALL, M.Sc., F.G.S. JOHN W. TAYLOR, M.Sc.
RILEY FORTUNE, F.Z.S.

Contents :—

LONDON:
A. BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.
Printers and Publishers to the Y.N.U.

Price 9d. net. Prepaid Subscription 8/6 per annum.

refer to the American fauna and flora, British naturalists would do well to consider them and draw valuable lessons therefrom. Among them are ' A Source Book of Biological Nature Study,' by E. R. Downing (530 pp., price three dollars). This is really intended for teachers and advanced students. By the aid of over 300 well chosen illustrations almost every branch of nature study is touched upon, by an expert, and in addition interest is given to the studies by the practical hints given in the manufacture of the necessary apparatus for collecting and studying the fauna and flora of North America.

AMERICAN ZOOLOGY.

Other publications from this house include ' A Laboratory Manual for Elementary Zoology,' by L. H. Hyman (149 pp., one dollar fifty cents.). As the object of this book is to introduce the student to zoology, it ' includes sections and appropriate exercises on general physiology, cytology, histology, embryology, heredity, classification, although it is devoted in the main to a study of the structure of representative animals.' As showing the *practical* side of this work —we find ' General Directions—(1) Obtain from the cashier's office a biology breakage ticket and deposit it with the storekeeper in Room No. 10. (2) Obtain from the laboratory instructor a microscope card and present it at Room No. 2 for a microscope. (3) Obtain at Room 10 the following supplies, etc.' Mr. E. R. Downing has also issued a volume, ' A Field and Laboratory Guide on Physical Nature-Study ' (one dollar ten cents.) and a similar work dealing with Biological Nature Study. These are on the loose-leaf principle —interleaved with blank paper for notes and are capable of expansion as the students' observations accumulate — in addition to which the records can readily be sorted and made available at a moment's notice.

WHALING RELICS.

The following is from *Nature* :—' We welcome the reappearance of " The Mariner's Mirror," the journal of the Society for Nautical Research. Mr. T. Sheppard contributes an article on the Hull Whaling trade, once of great importance, from which the present great fish and oil trades may certainly be said to have developed. Mr. C. Pickering has made a fine collection of objects connected with the business, and presented a large museum devoted to the fishing industry. Mr. Sheppard, in his article, describes and illustrates many interesting exhibits—" flensers " for cutting the blubber into strips ; the seal picks used by men working in masses of ice ; a wrought-iron gun-harpoon bent by the speed which the whale dragged the boat after it ; one of the old explosive harpoons, known as Balchim's patent ; harpoons and gun

spears, with a collection of old guns. He also reprints an interesting journal describing the wreck of the whaler Thornton which was lost in 1821. The city of Hull is honourably distinguished for the zeal and enterprise shown in the preservation of relics of its former industries.'

LEEDS NATURALISTS' JUBILEE.

We should like to congratulate the members of the Leeds Naturalists' Club on its Jubilee, and on the exceedingly successful conversazione held at the Leeds University in its commemoration. Mr. J. W. Taylor, one of the founders, gave a short historical sketch of the Club. It originated in a Rambling Club connected with the Young Men's Christian Association, which was founded in 1869, by James Brodie. On February 28th, 1870, under the Chairmanship of the Mayor (Mr. Glover Joy) Messrs. Brodie and Taylor organised a meeting, as a result of which the Leeds Naturalists' Field Club came to be. Early in 1872 the Club absorbed the membership of 'The Leeds Scientific Association,' and as a consequence the name was changed to 'The Leeds Naturalists' Club and Scientific Association." The Club had a varied career, it being at one time necessary publicly to advertise the imminent dissolution of the Club. By the aid of the late W. Denison Roebuck, Prof. E. O. Croft, Mr. J. H. Gough and Mr. J. Digby Firth (who was especially successful in cementing good feelings between the University and the Club), it survived and has since progressed—being probably at no time so vigorous as at the present moment, having the co-operation of the Professors of the Leeds University.

MR. G. W. LAMPLUGH'S ADDRESS.

At the recent Anniversary Meeting of the Geological Society of London, the President, Mr. G. W. Lamplugh, discussed 'Some Features of the Pleistocene Glaciation of England,' dealing principally with the changes brought about by the ice in the surface-features of our country. With the aid of a sketch map he showed that over 5,000 square miles of English land, or about one tenth of the whole country, would vanish if the drifts were removed, as the 'solid' rocks lie below sea-level in tracts of this extent. A further area of about 10,000 square miles is overspread by drift of sufficient thickness wholly to mask the 'solid' land-forms, so that rather more than one-quarter of the country owes its present shape to Glacial and Postglacial deposits. Another 20,000 square miles was glaciated and more or less modified, but without losing the dominating features of its rocky framework. The remainder of the country was affected only by the intensification of the atmospheric agencies, whereby its original features were accentuated. In

a general sense, the hill-districts have not been greatly changed, but the lowlands have been in most parts completely altered.

SOURCE OF MATERIAL.

The source of the huge mass of material contained in certain of the lowland drift-sheets was next considered, and the opinion was expressed that a large portion of this was an addition to the land, brought in by the ice from outside our present coast-line. The position and extent of these drift-sheets could be explained by regarding them as the broad terminal belts of débris concentrated where the ice from the basins thinned off towards its periphery, and where also its motion was checked by the rising slope of the ground. The débris-choked outer margin of the ice may be supposed to have become stagnant after its final forward spurt, and in its waning phase most of its thaw-water probably escaped backward into the basins, leaving wide stretches of bare boulder-clay unencumbered with water-washed material. Many peculiarities of the drift-features were explicable on the supposition that the ice-movement was not continuous and regular, but proceeded, at the margin of the ice sheets, by alternations of quick advance with longer intervals of stagnation or relative quiescence, such as have been observed now in existing glaciers and ice-sheets in many parts of the world.

DISTRIBUTION OF GLACIAL DEPOSITS.

The unequal distribution of the Glacial deposits in the area of scanty drift was then discussed, along with some local peculiarities in the shape assumed by the deposits in several places, and it was shown that the difference between the aspect of the main drift-sheets and the scattered drift could be accounted for by the difference of local conditions, which led to original irregularity of deposition and to early exposure of certain tracts to exceptionally vigorous erosion. It was also pointed out that the local incidence of glaciation may often have been an important factor, as it is known from existing conditions in Arctic lands that great stretches of moving ice may leave bare land, aside from its path, at lower levels on its flanks. Comment was then made on the curious rarity of peat or other land-detritus in boulder-clay known to have been derived entirely from the land, and this was thought to indicate that the conditions for a long period before the actual glaciation had been unfavourable for the growth of timber or peat-producing vegetation. A brief review was given of the minor changes and new erosion-features produced in the hills as the result of the glaciation. The effect of Post-glacial erosion and deposition in modifying the Glacial features was also referred to.

ANOTHER VERSION.

According to *Public Opinion* 'what England looked like about 30,000 years ago, at the glacial period, was vividly described by Mr. G. W. Lamplugh. The weather was alternately heavy, stormy and calm, powerful floods, and low temperature in the valleys; while the seas round England were at a higher level than to-day. All the lower lands on the east had undergone great change since, but if a hill man of that period were resurrected he would probably be able to find his way about the high land of the country to-day without great difficulty. There was a great bay covering the whole of the Fen country, and the Mersey and the Dee had a common estuary, whilst a lot of Suffolk was submerged. At one period this island was apparently about one-fifth the size. The elephant and rhinoceros at one time *stalked the land.*'

ABRAXAS GROSSULARIATA.*

We have received a copy of this Compendium. As every lepidopterist knows, the Rev. G. H. Raynor has specialized on *Abraxas grossulariata*, and undoubtedly has been the means of inducing a large number of our lepidopterists to take a special interest in this fascinating species. Mr. Raynor's early work was of the greatest value, and perhaps nothing in it more so than the bestowing of varietal names on some of the widely different wild forms. But of late years, in the naming of supposed varieties, he has equally surely allowed his zeal to outrun his discretion. The first mistake occurred in 1902, when Mr. Raynor named (*Ent. Record* XIV., p. 322) as *lacticolor* the exact form which had many years previously been named and described as var. *flavofasciata*.

In this Compendium Mr. Raynor still sticks to the name *lacticolor*, giving *flavofasciata* merely as a synonym. And under the group *lacticolor* he gives names to eleven other forms, of which all those the writer has seen were well covered by the original name *flavofasciata*. But in the names given under the *varleyata* group, most of which appear in this Compendium for the first time, the evil is very much aggravated. Mr. Raynor has had comparatively little experience with this form, and judging from his names is apparently unaware that the sexes of the form usually differ totally in appearance. Hence he actually gives a fresh name to the typical male, and *another name* to the typical female.

It would of course be just as reasonable to describe under distinct names the sexes of every species of the vast number

* A Compendium of Named Varieties of the Large Magpie Moth, *Abraxas grossulariata*. By the Rev. G. H. Raynor, M.A., 7 pp., price 3s. 6d.

of lepidoptera in which the sexes differ in colour or markings. Another name is given to an ordinary *varleyata* because it ' has a few tiny specks of white in the black area of the hind wings.' Another name is given to a specimen because it has a broader white fascia than *he thinks* the type should have, and yet another name to a form because it has a narrower fascia than he supposes the type should have. The original description of *varleyata* said nothing as to the width of the fascia or band on the fore wings, but reference was made in it to the illustration in Mosley's ' Varieties ' (fig. 1), and that in Newman's ' British Moths ' (fig. 5), as well representing the form. In Newman's illustration the fascia is narrow, in Mosley's considerably broader. Mr. Raynor gives another name to a specimen because it has a black spot in the white band, and another name to one because it is ' without a black spot in the white band.' Newman's figure indicates a black spot, and Mosley's is without; also in the illustration of *varleyata* (fig. 5), in South's ' Moths of the British Islands,' the black spot is very distinctly represented.

Another name is bestowed on a form because ' the white band does not reach the costa,' which is quite a common occurrence in both the wild and bred moths. Could anything be more preposterous than such work as this? There is not one of the above forms, all of which occur wild, which is not thoroughly well covered by the original description of *varleyata*, and as such these proposed new names cannot of course be valid. The other forms named by Mr. Raynor (with the exception of that to which he gives the name *crocea*, which was previously known, though not described, as *luteavarleyata*) have been obtained by crossing with *varleyata* forms which do not occur wild with *varleyata*, some of them indeed already ' manufactured ' forms, and as being never likely to occur in a wild state, are, to scientific students, not worthy of names at all; but in any case, being real *varleyata*, should have had that name linked with them, as was done in the case of *albovarleyata* (E.M.M., April, 1917, p. 86). As a variety *varleyata* is so unique in appearance that there can be no mistaking any form that should come under it. We are sorry to have to criticise this Compendium so adversely, as we have the greatest admiration for so much of the entomological work the author has done; but such work as this cannot be too strongly deprecated, creating as it does the contempt and ridicule of outsiders in relation to entomological science.—G.T.P.

ANOTHER ' DISCOVERY.'

Some evidence of the provincial nature of the journal ' Discovery,' referred to in our last number, is given in the

following letter since received from the Publishers :—' The Editor of ' Discovery ' has asked me to discontinue sending you copies of the journal. I shall be glad if you would cancel our ' exchange ' arrangement.—Yours truly, John Murray.' From this it would appear that the Editor can only see his way to exchange with those who give him favourable notices, and that honest and fair criticism is not required. We have for years received most of the Scientific Journals in this country, and while we have not always flattered them, and in some cases have criticised them in the same way as some have criticised *The Naturalist*, this is the first occasion upon which an exchange has been discontinued as a result of speaking the truth. However, we have reason to think that good will result from the criticism which appeared in our journal, and while we are not likely to spend 6d. a month in order to possess ' Discovery,' it is still possible that we may see it.

A FURTHER SHEFFIELD ' DISCOVERY.'

We learn from *The Times* that ' Valuable deposits, important both to commerce and geological research, have been discovered in the Peak district of Derbyshire by Mr. C. S. Garnett, F.C.S., of Sheffield University, after two years' research. It is claimed that these discoveries, if developed, should revolutionize some of the industries which at present have to depend on foreign importations. The most important mineral disclosed is nickel ore, of particular interest at the moment because of the proposal to introduce nickel coinage. Specimens of this mineral have now been found at mine workings at Warrencar, Darley Dale. The nickel deposit, which has an average thickness of about half-an-inch, is a pale green emerald incrusting deposit upon surfaces of dolorite (*sic*), which have been thoroughly decomposed by weathering. The purer portions appear as somewhat vitreous crusts, but the mass contains a large amount of hydrozincite, which renders it pale in colour and dull in lustre. Another discovery is of amethyst, so largely used for ornaments. This, like the nickel, is a new discovery, and never before found in Peakland. Large and beautiful amethysts have been found at Calton Hill, near Buxton, where cavities lined with quartz occur in the basalt agglomerate. Near Darley also small specimens have been unearthed from cavities in the much decomposed lava. A very rare variety of red fluor spar, of much finer colour than the examples in the British Museum, have (*sic*) also been found in a small vein near Ashover. Mawe, the historian, in 1802 recorded the fact that ruby-coloured fluor in perfect cubes were (*sic*) said to have been found in Derbyshire. Now comes the actual fact, nearly a century later.'

MORE ' DISCOVERIES.'

There seems to have been an epidemic of ' discoveries ' of one sort and another in the Sheffield and Derbyshire area recently. Since the above paragraph was put into type we find the following in *The Yorkshire Post* :—Mr. C. S. Garnett, of Matlock, in reply to questions from our Matlock correspondent said :—' There are extensive deposits of phosphates extending over a big area of Peakland, which have recently been inquired into from a commercial point of view. As a matter of fact, I do not think any actual decision has been come to. As for myself, I know that these deposits do exist, and that they will compare very favourably with the deposits which are worked in other parts of the country. Asked as to where the deposit was found, Mr. Garnett said it was all the way from Matlock to Bakewell. He produced sample nodules which resemble other English deposits, and stated that while some of the Cambridge deposits are 28ft. to 35ft. from the surface, the deposits in the Peak district are quite near the surface in many instances, and the deposit is 6 in. in depth. Yesterday Mr. Garnett completed an analysis of the Peak phosphates, which compares very favourably with other phosphate-bearing areas of the British Isles.'

SALT.*

' Cæsar's *saltinators*, who found the natives of Cheshire procuring brine from little natural springs in the neighbourhood of Northwich and Nantwich, taught them to boil the brine and precipitate the salt crystals in open pans set over open fires, and in the following 1700 years all the salt of Cheshire was manufactured by that process. With the discovery of rock salt, in 1670, mining was introduced, and for another 200 years both rock salt and brine salt were produced. But . . . the mines collapsed in rapid succession from about the middle of the nineteenth century, and fresh water breaking into the abandoned workings converted them into the brine reservoirs from which the saltmen have since obtained their inexhaustible supplies of brine.' The author explains why so little has been written in reference to the salt industry ; gives a fascinating narrative of its ups and downs, describes modern methods of obtaining salt, and reproduces photographs of remarkable effects of subsidences due to the salt workings.

——: o :——

Mr. H. G. Sargent recently read a paper to the Geological Society of London on ' The Lower Carboniferous Chert-Formations of Derbyshire,' but from the discussion which ensued it would appear that his views on the subject were not generally accepted.

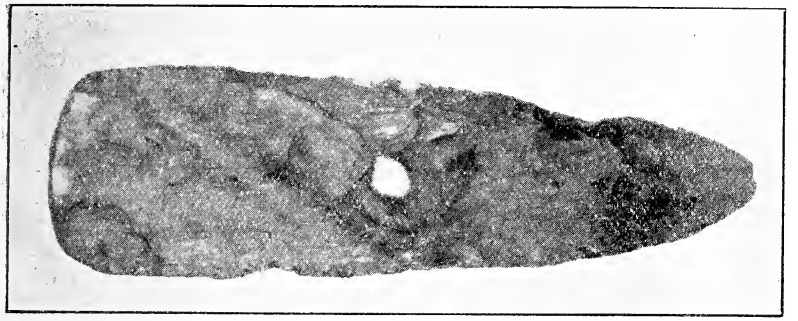
---

* By A. F. Calvert. London : Sir Isaac Pitman & Sons, 151 pp., 2s. 6d. net.

NEOLITHIC FLINT IMPLEMENT FROM DONCASTER.

H. H. CORBETT.

By the kindness of Dr. Renton, of this town, I have just acquired for our Museum the most interesting neolith that I have ever seen from this district. It is of blue flint and its dimensions are, length, 9 ins. ; width, 2.75 ins. at the widest



part. A transverse section in the middle of the implement is lozenge-shaped. From the butt end it gradually narrows to the opposite extremity. The surface is chipped and flaked throughout, and except at the broader end there is no polishing. The broad end, however, is highly polished and the polishing extends for about 2.5 ins. along the weapon, and on both surfaces gradually becoming less evident and yielding place to the general chipped surface. This polished end is too narrow to be of any use as a hammer, and too blunt for the cutting end of an axe. The opposite end shows signs of having been the ' business end ' of the implement, being much chipped and broken. Taking all these features into consideration, I have concluded that this weapon is a dagger, or a skinning

knife, and that the polishing of the blunt end is due to long use as a hand-grasped implement. Such weapons are of course well known among palæoliths, and are generally known under the name of 'hache,' but I cannot find anything either figured or described in Evans's 'Stone Implements' at all like the weapon here described. The photograph has been taken by Bagshaw & Sons.

The implement was turned up by the plough recently at Armthorpe, near Doncaster, and coming into the possession of Dr. Renton, was presented by him to the Museum. As our Scientific Society is shortly expecting a visit from a well-known archæologist, officially connected with the Hull Museum, it is hoped that his valuable opinion on the matter may be obtained. Great care will be taken that it does not by any mischance get into his bag !*

[This is a remarkable implement ! I have never seen one previously—bearing the general type of a neolithic axe-head—but with the 'cutting edge' rounded off and polished ; and Mr. Reginald Smith, F.S.A., of the British Museum, tells me the type is new to him. There is apparently nothing like it in the Mortimer collection—which contains the largest collection of Yorkshire neoliths in existence.—T.S.].

——: o :——

The Annual Report of the Spalding Gentlemen's Society for 1919 contains a record of several interesting additions to the Society's Museum and Library.

Mr. T. Sheppard, M.Sc., who has represented the Yorkshire Naturalists' Union at the Meetings of the British Association for several years, and was the vice-president of the Conference of Delegates at the Newcastle meeting in 1916, has accepted the invitation of the Council of the Association to be the president of the Conference of Delegates at the Cardiff meeting in August next.

The eighteenth Annual General Meeting of *The South West Yorkshire Entomological Society* was held at Shelley, on January 10th, 1920, Mr. B. Morley, President, in the Chair. The President and other officers were re-elected, and several new members were elected. Among the exhibits were (by Mr. Morley) long and varied series of *Hybernia defoliaria* and *H. aurantiaria* ; interesting series of locally taken *Acalla variegana, Tortrix forskaleana, T. conwayana,* and local specimens of *Olethreutes salicella* and *Gypsonoma neglectana*. (By Mr. T. H. Fisher), second brood specimens of *Arctia caja* ; variations of *Chrysophanus phlaeas* ; local specimens of *Incurvaria tenuicornis, Gelechia longicornis, G. scalella* and *Cerostoma sequella*. (By Mr. J. Hooper), dark forms of *Cosmia affinis* and variations of *Hybernia leucophearia* and other hybernids. (By Mr. D. H. Harrison), a living *Vespa vulgaris* ♀, taken in the open early in January. (By Dr. H. D. Smart), a few locally taken insects of orders other than lepidoptera including the rare dipteron, *Xylophagus ater, Chironomus dorsalis, C. dispar, C. plumosa* and *Tanypus varius,* the last four species being apparently new to the county.—H.D.S.

---

* On the principle of 'set a curator to catch a curator,' we presume. —Ed.

OLD PLANT RECORDS OF THE HUDDERSFIELD DISTRICT.

W. E. L. WATTAM, NEWSOME.

THE herbarium of plants made by Mr. Allen Godward, the oldest member of the Huddersfield Naturalist, P. & A. Society, has been presented to the Biological Department of the Huddersfield Technical College. The collection is in a very good state and contains several plants of which no previous record for the Huddersfield district seems to be in existence, as well as confirmatory records of many which formerly existed, but are now extinct in that district. At the suggestion of Dr. T. W. Woodhead, I have examined the collection. The earliest records date back to 1868, but in addition there are a few sheets of plants, collected between 1857 and 1860, by Mr. George Godward, who, I am given to understand, was the father of Mr. Allen Godward.

The following is the list of plants apparently not on record as having occurred in the Huddersfield district, viz. :—

Thalictrum flavum L. River side, Whitacre (Hillhouse), 1858 (G. G.).

Gnaphalium sylvaticum L. var. *rectum* Sm. Thurstonland, 1876.

Pyrola rotundifolia L. Roydhouse Wood, near Farnley, 1858 (G. G.). In all probability *P. media*: see obs. to *P. rotundifolia*, Lees' Flora, p. 320.

Polemonium caeruleum L. Farnley Woods, 1860 (G. G.).

Mentha piperita Huds. Banks of Rushfield watercourse, 1860 (G. G.). ? A garden escape.

Potamogeton pusillus L. Near the Black Horse Inn, Dalton, 1889.

Carex acuta L. Canal Bank, Deighton.

Cryptogramme crispa Br. Old road, Standedge, Marsden, 1860 (G. G.).

Nephrodium Filix-mas Rich., var. *incisum* Newm. Top of Penny Spring Wood, Lowerhouses, 1860 (G. G.).

Other interesting plants of the Huddersfield district, of which no record appears in Lees' Flora, are as follows :—

Epimedium alpinum L. The following note is written on the sheet :—' Introduced into John Armitage's garden from Luddendenfoot.' ' A wood in that district with any quantity.' No date is given. See notes regarding this plant in Lees' Flora, pp. 128 and 781.

Vicia sylvatica L. Roydhouse Wood, near Farnley, 1870. Now extinct.

1920 April 1

Carduus heterophyllus L. Wessenden, Marsden, 1886. I have also seen this plant growing by the side of an old cart-lane near Nont' Sarahs' Inn, Scammonden, leading to the Deanhead Valley, in 1887 ; it is now extinct in that locality.

Senecio erucifolius L. Lumb, Castle Hill side, 1880.

Andromeda polifolia L. The specimen is from Slaithwaite Moors, collected in 1868, with a footnote, ' Burnt up, 1870.'

Erythraea Centaurium Pers. Farnley, 1870.

Orchis Morio L. Dalton, 1885.

Habenaria viridis Br. Pastures bordering Molly Carr Wood, Farnley, 1860 (G. G.), 1898 (A. G.).

——: o :——

The *Journal of the Ministry of Agriculture* for February contains well illustrated articles on Farm Drainage Machinery and Land Drainage.

The Lancashire and Cheshire Naturalist for February includes ' Variegation,' by Dr. L. Doncaster, and ' The Lesser Celendine,' by A. A. Dallman, much of the latter referring to Sussex.

Among the Contents of *The Journal of the Manchester Geographical Society*, Vol. XXXIV., pts. 1-4, are ' British Cartography during the War,' by Col. H. T. Crook ; ' Mythology of Mankind,' by Miss K. Qualtrough.

As Publications Nos. 82 (8/6) and 83 (1/-) respectively, the *Manchester Museum* has issued ' The Fossil Foraminifera of the Blue Marl of the Côte des Basques, Biarritz,' by Edward Halkyard, E. Heron-Allen, and Arthur Earland ; and ' Notes on Myriopoda, a revision of some Fossil Material from Sparth Bottoms, Lancs.,' by J. Wilfred Jackson, Hilda K. Brade-Birks and the Rev. S. Graham Brade-Birks.

Part V. of Vol. VIII. of *The Proceedings and Transactions of the Croydon Natural History and Scientific Society* contains a remarkable series of meteorological observations during 1918, prepared by F. Campbell-Bayard. There is also the Presidential address of Asst.-Commander Edward A. Martin on ' Some Considerations Concerning the Constitution of the Inner Earth,' and Mr. W. Whitaker gives his fifth paper on ' Some Surrey Wells.'

No. 297 of *The Quarterly Journal of the Geological Society* brings the records of the Society's work up to June, 1919. It includes the presidential address of Mr. G. W. Lamplugh, delivered in February, 1919, in which he dealt with ' The Structure of the Weald and Analogous Tracts ' ; Dr. Smith Woodward writes on ' The Dentition of *Climaxodus*, and there are notes on the superficial deposits of south-east England by Messrs. W. Whitaker, G. M. Davies, C. J. Gilbert and G. Barrow.

We have received *The Archives of the Cambridge Forestry Association* (12 pp.). We learn that the editors desire to make an appeal for support rather than to pretend to furnish a serious contribution to science. ' The archives will be a collection of stray notes that are too valuable to be lost and yet do not provide sufficient matter for a paper. . . . There is no subscription to the association . . . . there are no rules and no officers, all work being undertaken by such as have the good will to do it.' From the ' Desiderata ' we gather that the Association would be glad of all manner of things from Microscopes and Photographic apparatus to tree trunks.

DISTRIBUTION OF THE REPTILIA IN UPPER WHARFEDALE AND UPPER AIREDALE.*

H. B. BOOTH, M.B.O.U.

THESE notes refer to the status of the local wild Reptilia, so far as I have known them during the past thirty years or so, and point out the apparently curious local distribution of some of the species. I shall be glad to have any records which will extend the area of any of the species in this district ; especially records from the head of either dale, and more particularly from the Langstrothdale portion of Wharfedale. The districts under investigation are the drainage area of the River Wharfe above the junction of the tributary Washburn, close to the town of Otley, and that of the River Aire above the Leeds city boundary. I will refer to these districts simply as Wharfedale and Airedale.

I have only four species to deal with, viz., the Slow Worm, the Viviparous Lizard, the Grass Snake and the Viper.

The Slow Worm (or the Blind Worm as it is often called, though I cannot understand why, as it has a singularly bright little eye).—In Wharfedale I have not any record of it lower down the dale than between Barden and Appletreewick ; where twenty-five years it was fairly common under large stones in several fields in the valley. Unfortunately visitors, including naturalists, became aware of its occurrence, and of its easy capture, and consequently the Slow Worm soon became very much rarer. I have seen it in Trollers Gill and have had it recorded from various places as far up the dale as Hubberholme. Only last year Mr. R. Butterfield reported an immature specimen from Cray, above Buckden. It doubtless occurs sparingly up to the source of the Wharfe ; as I have found it on the other side of the Pennines—in the drainage into the Irish Sea. In Airedale the Slow Worm apparently does not occur. My only record for it was given many years ago as on the railway embankment near Bingley. Fortunately the names of several persons were given for reference. On investigation it proved to be the Glow-worm that had been seen ! ! It is extremely curious that this legless lizard should occupy such a wide area in Wharfedale, and yet should appear to be, and to have been, entirely absent in the adjoining valley of the Aire.

I believe the Common or Viviparous Lizard to be very sparingly distributed over all our moors. But here again I

* Read at a Meeting of the Vertebrate Zoology Section of the Yorkshire Naturalists' Union on February 21st, 1920.

have few or no records for the extreme heads of the dales. The ' large Lizard ' reported on the summit plateau of Pennyghent (*The Naturalist*, 1906, p. 427) certainly is not referable to this species. I am at a loss to know what it was ; as it is certainly a strange place to come across an ' escape ' ! I would like to draw attention to an article by Dr. Boulenger in *The Journal of Zoology, Research*, Vol. I., 1917, pp. 1-16, saying that the Viviparous Lizard shows no variation in the whole of its distribution from Ireland, over Europe and Asia, to the islands in the Pacific. It is a most remarkable case of a species remaining stable, although exposed to the extremes of latitude and altitude over a very wide area. This seems one of the difficult problems evolutionists have to solve.

With respect to the Grass Snake or Ringed Snake, in Wharfedale, my only previous records are from a small area in Bolton Woods and in the neighbourhood of Laund House. Mr. T. Roose, however, informs me that it extends to a greater area in these woods, viz., from the hall nearly to Barden, and up into the Deer Park on one side, and up to the rough pastures of High Hare Head, near East Halton, on the other. They still exist, and he has caught at least six during the last three years. Apart from the neighbourhood of Bolton Woods I am not aware of any other record for Wharfedale.

Up to twenty-five or thirty years ago the Grass Snake used to be fairly common in the woods surrounding Bradford and Shipley, and usually two or three each year were seen, and KILLED, and reported or exhibited. Whenever one chanced to stray from its cover it was senselessly killed, in spite of the protestations of nature-lovers—who pointed out its extreme harmlessness. About the beginning of the twentieth century the reports of Grass Snakes were getting very noticeably less in that district. The last two that I know of, and that I saw (of course dead) was one at Frizinghall near to Heaton Woods, about 1900, and another at Shipley, killed near Spring Royd about 1904. The last of which I have a record was a very large one, killed in a wood at Low Moor, Bradford, in 1912. A few were reported to me from and around Bingley, in the 'nineties of last century. Mr. F. H. Edmondson says that one was occasionally caught or killed about Keighley, but that he has not seen or heard of one for at the least twenty years. Mr. Rosse Butterfield gives it as his opinion that ' snakes ' did occur between Riddlesden and Silsden, and he believes that they may still fo so—though rarely. In Elam Wood, near Keighley, and close to his present residence, Mr. Butterfield is certain that snakes did occur, and not rarely, thirty or forty years ago : but whether Grass Snakes or Vipers he cannot say.

The older inhabitants (including his landlady, who has

lived in the same house for forty-eight years) speak of them with dread. On festive occasions it was the custom to go into the wood, kill a snake, and nail it to some greenery. In my opinion there is no doubt but that they were Grass Snakes—as at this date this species was not uncommon in similar situations near Shipley and Bradford. If they had been Vipers the old inhabitants would have been able to substantiate their 'dread' by cases where people had actually been bitten. Further, Elam Wood, with its thick cover, is very much more a suitable situation for the Grass Snake than for the Viper. Higher up the dale I think that there have been records of the Grass Snake near Skipton ; but I am not able to lay my hands on them at the time of writing.

The last species, the Viper or Adder, extends sparingly over a large area in Wharfedale. It is comparatively common on Barden Moor, and it extends more sparingly to Burnsall Fell. On the other side of the valley it occurs on the Grassington and Hazelwood Moors, and Mr. Roose informs me that it is often seen on the Laund Pastures. In August last, on a very hot day, two were killed on Beamsley Moor, where it is considered to be rare.

In Airedale the Viper may be said not to exist ; but this is only part of the truth, as it does occur in just one corner of the dale. Barden Moor, in Wharfedale, just extends in one corner into Airedale, and the thriving colony of Vipers there extends into Airedale, and also on to the adjoining moors of Eastly, Embsay and Halton, all in Airedale. There is certainly a record of two dead Vipers being found tied together with string in the canal at Silsden, but without any record as to where they had come from, and Mr. R. Butterfield informs me that there is a Viper in spirits in the Keighley Museum labelled 'Silsden,' but from which he can obtain no further data.*

I have endeavoured to show that the Slow Worm extends over a large area in Wharfedale, but that it does not occur in Airedale at all ; that the little Viviparous Lizard occurs very sparingly on all our local moors, and, through Dr. Boulenger's paper, that it is a truly remarkable species, because it does not vary, despite latitude and altitude, over a very wide area. The Grass Snake was generally distributed at the least in certain parts of Airedale until the end of the nineteenth century, when it suddenly became very scarce. Also that it exists to-day only in a limited colony, so far as we know, in Wharfedale, and that the Viper is distributed over a wide area in Wharfedale and does not occur in Airedale, excepting where the Barden colony in Wharfedale overlaps into Airedale.

---

* *See* Postscript.

P.S.—Two members of the Crosshills Naturalists' Society who were present when the above notes were read informed me that the Viper in spirits and labelled ' Silsden ' in the Keighley Museum was one of the pair found in the canal at Silsden. They were perfectly certain about it, and said that Mr. S. L. Mosley, who was then the Curator of Keighley Museum, preserved one after the meeting of the Keighley Naturalists' Society at which they had been exhibited. Mr. Butterfield has since changed the jar and mounted this specimen. It is surprising how easy it is to fall into errors! I am much obliged to them for having cleared up this otherwise doubtful record.—H.B.B.

——:o:——

Miss Whitmell has presented the library and scientific collection of the late C. T. Whitmell to the Leeds University. The gift includes a telescope, a fine binocular microscope, spectroscope, and a large amount of appliances particularly devised for experiments upon electricity and light.

The death is announced of Henry Charles Beasley, who did so much in connexion with the collection, preservation and classification of the fossil footprints in the Trias of Storeton and other places in the Cheshire area. Mr. Beasley was a hard worker in the cause of geological science, was honoured by the Liverpool Societies and by the Geological Society of London, and wrote many important memoirs. He was 83 years of age.

The Annual Meeting of the Yorkshire Philosophical Society was held recently in the Tempest-Anderson Hall, York, the Rev. C. Yeld presiding. Mr. C. E. Elmhirst (hon. secretary) read the report of the council, which stated that the membership had increased from 482 to 545. The council regretted that owing to continued ill-health their curator, Mr. Oxley Grabham, who had been associated with the work of the Museum for 14 years, had resigned.

We regret to announce the death of Michael Charles Peck, at Scarborough, in his 85th year. He was formerly a successful printer and stationer in Hull. He was a founder of the Hull Literary Club, and a member of the Yorkshire Naturalists' Union. Since living at Scarborough he took an interest in the Literary and Philosophical Society there, and was its president in 1909. He was a keen conchologist and had a fine collection of shells.

We learn from the *Yorkshire Weekly Post* that at a recent meeting of the British Ornithologists' Club, Mr. P. F. Bunyard exhibited a clutch of eggs taken in Ireland which he held to be those of the hobby. This view was questioned by several members, who contended that it is most difficult to distinguish with certainty the eggs of the hobby from those of the kestrel. At the last meeting Mr. Bunyard appeared with a large series of the eggs of both birds, and said he had never yet seen a well-authenticated clutch of hobbies' eggs that could possibly be confused with those of the kestrel, and in ninety-nine cases out of a hundred they could easily be picked out by an experienced zoologist. Thereupon another member produced a case of eggs of the two birds, and asked Mr. Bunyard to identify them, an offer that, on consideration, was respectfully declined. The fact, of course, is, as most egg-collectors well know, that the eggs of many species, nearly akin, overlap, as it were, in character to such an extent that certain identification, apart from a clear sight of the bird on the nest, is practically impossible.

THE NATURALIST AND THE GARDENER.

WILLIAM G. SMITH, B.Sc., PH.D.

(*Continued from page 95*).

The effect of stimulating manures in producing variation is often referred to by gardeners. There is a quaint old illustration written in 1730, and quoted in the Floricultural Cabinet of 1835, a gardening paper conducted by Joseph Harrison, gardener to Lord Wharncliffe. 'If when you have a good stock of breeding Tulips, you cannot have patience to wait for their natural course of breaking into stripes, you may take the following method, as is practised in Flanders: Take the plaister of old walls wherein there is a great deal of lime, and powder it very fine; mix with this drift sand found on the seashore; to this add of the water that runs from a dunghill, an equal quantity of each, and put over the surface of the bed a little before you plant your Tulips, and it will make them break into stripes to a wonder.'

The next step, after variation has taken place, is to fix the type. How this is done under natural conditions has been the subject of much discussion, but when man becomes the selective agent, we now and then obtain a glimpse of his methods. There is an old-fashioned flavour in this extract from Patrick Shirreff: 'My experiences in the improvement of cereals arose from the following circumstances: when walking over a field of wheat on the farm of Mungoswells in the spring of 1819, a green-spreading plant attracted my notice . . . . . Next day measures were taken to invigorate its growth by removing the surrounding vegetation and applying manure to its roots.' Sixty-three ears of wheat were harvested from this plant, and these were the origin of 'Mungoswells Wheat.'

The garden Carrot, an old cultivated plant, has in more recent years been produced from the wild *Daucus carota* by several experimenters. L. Vilmorin, the founder of a large firm of nurserymen in Paris, noticed in 1833 some seedlings of the wild carrot, an annual, which flowered later than others; seed was saved from these and sown. During the next three generations, those plants with the thickest roots and latest flowering heads were saved for seed. Ultimately about nine-tenths of the progeny were satisfactory carrots, but the colour varied from yellow to red and lilac. James Buckman* also obtained carrots from the wild parent, and tested the parentage of several other vegetables. In the case of the Parsnip, seeds were collected from wild plants, near Cirencester

* *Jour. Roy. Agric. Society*, XV., 1854.

.920 April 1

in 1847, which had tough wiry roots, tapering downwards. The seeds were sown and the plants with the largest roots were allowed to seed. The third generation gave plants with fair-sized roots and leaves like the cultivated form. A selected type was placed on the market and named 'Student' (Sutton). This has attained to half a yard long, and has gained prizes in competition with other cultivated strains, even in recent years. The evolution of several sorts of garden Celery has been described by H. Vilmorin.* The wild plant is a perennial in marshes and ditches along most of the Mediterranean coasts. It was cultivated in old Roman gardens, but probably more as an ornamental plant than a vegetable. The first aim of selection was to increase the size of the petioles, and by choice of plants with solid petioles to eliminate the hollow leaf-stalk of the wild plant; suckers or side-shoots were also rejected. The result was a green celery of the 'Paschal' type. Self-blanching celery was observed about 30 years ago by a gardener near Paris. The seedlings from the original plant included a proportion of the new type, but also green plants, and even after prolonged selection there is still a tendency to yield green plants. Selection along other lines has yielded the 'Erfurt' and 'Prague Turnip-rooted celery,' in which the fleshy solid base has been developed to furnish a sweeter and stronger flavoured salad plant, with less valuable petioles.

These examples could be multiplied indefinitely, and they illustrate what is going on to-day in hundreds of plant-nurseries. Man is here the selective agent and naturally he selects for his own purposes. Turning from man to nature, it is necessary to find selective agents to take the place of man. The primary essential among wild plants is that the new variety can survive in the competition with members of its own species and of other species. The new variety must find a place in the vegetation, and the new characters assumed must be of some advantage, or at least be no hindrance in the struggle for existence. It would take us too far to enter into the theories of natural selection. Charles Darwin preferred the view that the stages were many and the progress slow. H. de Vries considers that many new varieties are mutants, appearing suddenly and sharply distinct from the parent stock, and constant in their new features.†

A few examples may illustrate the accomplished evolution of constant varieties in our native flora. The naturalist familiar with J. Hooker's 'Students' Flora' will recall the numerous varieties recorded in the Cruciferæ, including the

* *Gardener's Chronicle*, 1900, p. 164.

† *See* 'Theories of Evolution,' by Agnes Robertson. *The Naturalist*, May, June, July, 1907.

note that Jordan separated many forms of *Draba* (*Erophila*) *verna*, because they remained specific when cultivated, and reproduced from seed more or less constant. Jordan, in the south of France, and Wittrock in Sweden have both cultivated at least seven constant varieties of the annual Field Pansy (*Viola*), some of them perennial. The Mountain Viola has two well-marked forms, the yellow (*Viola lutea*) and the purple (*V. amoena*). The variety *Chelidonium majus* v. *laciniatum* has lobed petals and more deeply divided leaves, and G. C. Druce in a recent note (1918) states that thousands of seedlings have come constant under his cultivation. Friedmann (1912) gives the origin of this variety as a mutation or sport observed in a garden in Heidelberg in 1590. The British Flora includes many more cases where there is evidence that new varieties reproduce from seed, true to character. The case of a perennial plant transferred from one habitat to another is less convincing, though constancy is often noteworthy. A glaucous variety of Sheep's Fescue grass has been in my garden since 1912, and it still resembles its fellows living on the coasts of the Forth. Sea Daisy (*Armeria*) from the seashore or the mountains, and Alpine Lady's Mantle also retain their characteristic features in a suburban garden, except that the compact habit tends to be lost. The bulbil-forming *Poa* from the mountains also reproduced itself from bulbils for several years.

Nanism or the dwarfing of arctic and alpine plants is familiar to botanists. The causes and effects have been frequently discussed, and a recent summary by the Swiss veteran, C. Schröter* has a direct bearing on our topic. Many species with a restricted Alpine distribution lose their characteristic form when grown in the lowlands. Edelweiss becomes greener because the coating of hairs is less dense. This degeneration may be partly prevented by placing the plants in an ice-chest during the night, but the lack of the intensive light of high altitudes has a detrimental effect not so easy to counteract. Alpine plants of this kind have growth-forms that are not constant or hereditary under sub-alpine conditions. On the other hand some alpines are constant, *e.g.*, Willows (*Salix reticulata* and *S. herbacea*), many of the Saxifrages, *Dryas octopetala*, *Silene acaulis*, etc. The constant dwarf habit may be accounted for in two ways. It may be a permanent environmental modification derived from a prolonged period of alpine (or arctic) conditions. It might also be a discontinuous variation or mutation, whereby a dwarf form ' sported ' from some other form, and it does not follow because a plant is dwarf that it took its origin in the arctic-alpine region. These

* ' Pflanzenleben der Alpen,' Zurich, 1908.

possibilities require further evidence before a decision is possible. In considering them, the further possibility of species originating from more than one parent centre should not be overlooked. F. E. Clements has called this polygenesis, and where, as in the case of arctic-alpines, the species show several widely distributed and isolated centres of distribution the theory is a tempting one.

This question of constant or inconstant variation cannot be too carefully considered, especially by those proposing to multiply the number of species and varieties of plants or animals. The time has come when science can demand a real proof, not a hypothesis. If a form with well-marked morphological characters has a wide distribution over a considerable area, it may be regarded as constant if it propagates itself from year to year true to type. When this form comes to be described as a new variety, the text should include a record of its distribution, accompanied by evidence (specimens, photographs, etc.) of its constancy from year to year. If in its distribution the plant occurs in more than one distinct plant association, and does not alter in its morphology, then the chain of evidence will be stronger. The series of forms seen in a water plant, such as *Polygonum amphibium* indicates inconstancy, or as F. E. Clements* expresses it, there is a water ecad and a land ecad with intermediate forms. On the other hand, there is a dwarf variety of *Deschampsia caespitosa* found abundantly throughout the hilly regions of Britain up to considerable altitudes and in varying habitats, hence it may be regarded as a constant. Another line of evidence is secured by observing the effects of transplantation. This may consist in sowing seeds or transferring plants from one habitat to another, distinct from the alpine, seashore, or other environment. The garden is a new habitat suitable for the growth of many wild plants, and if the garden were more utilised, it is probable that much useful information on life history and characteristics would be secured.

(*To be continued*).

——: o :——

The services rendered to the iron and steel trade during the war by Mr. Scoby Smith, C.B E., J.P., and Mr. J. J. Burton, J.P., were fittingly recognised at the Cleveland Club, Middlesbrough, recently, when a presentation dinner was given in their honour by the Cleveland Ironmasters' Association and the North of England Iron and Steel Manufacturers' Association. Sir Hugh Bell, Bart., presided, and the 70 persons who sat down to dinner were fully representative of the industry in the North. Sir Hugh Bell made the presentations.

* 'Research Methods in Ecology,' Lincoln (Neb.), 1905.

BIRDS OF THE EASTBY DISTRICT, YORKSHIRE.

W. ROWAN, B.Sc., M.B.O.U., WINNIPEG.

(*Continued from page 106*).

Wheatear.—Fairly abundant and evenly distributed. Several nests were found far from rabbit burrows, but in the ground. Not one in walls. Young frequent vicinity of nest for a long time after flying. Arrivals from end of February onwards. Laying from second week May.

Hedge Sparrow.—Resident in fair numbers at Sanatorium No apparent increase for breeding as with other species.

Dipper.—Resident and common. Every stream of any size has its pair. Numerous on Wharfe and several pairs round reservoirs.

Wren.—Resident and common round Sanatorium and elsewhere. It is one of the most typical of moorland birds and as in the mountains of Wales and the Lake District seems to turn up in the loneliest of places.

Spotted Fly Catcher.—Most abundant of the summer migrants, common everywhere. Arrival second week, laying last week May.

Pied Fly Catcher.—Confined to Wharfedale, where thinly distributed. Arrival third week May, laying first June.

Swallow.—Common, said to be more abundant this year than usual. For the first time a pair nested in one of the Sanatorium sheds and raised two broods. To be seen over the moors almost at any time. Arrival 10th April, Bolton; around moors 27th April.

Martin.—Common. A pair built a nest in Birch's stable against a rafter under the ceiling, and had many attempts before getting it fixed. Frequent against windows under top sash, Eastby and Embsay. Always to be seen hawking around the various crags far from any buildings. Arrival last week April.

Sand Martin.—Several colonies in banks of Wharfe. Some nests only a few feet above water. Laying from last week May.

Green Woodpecker.—One shot in Crookrise Wood last December. Nearest present nesting place, Thorleby Springs, near Gargrave (Clark). Has nested at Bolton Abbey (Nelson's 'Birds of Yorks.', p 273).

Great Spotted Woodpecker, Lesser Spotted Woodpecker.—The tapping of one of these two birds was heard time after time in the Barden end of Nelly Park in May, 1919, but we could not get a view of the bird nor did we hear

it's call-note, and hence identification was not made. The presence of either species is, however, interesting.

Cuckoo.—Very abundant. The favourite laying grounds are on Barden Moor, in the neighbourhood of the Low Dock and along the top wall, where nine Cuckoos have been seen at once. They are fond of sitting on the walls. First heard on the 17th April, but not again till the 1st May, whence onwards frequent. Departure of old birds from mid-July. Young flying mid-June.

Swift.—Common. Nesting in large numbers in Barden Tower and Bolton Abbey. They fly very far afield. Have seen a large flight right on the moors far from any dwelling in June. Arrival, Barden, 14th May.

Nightjar.—Fairly plentiful on moors. A pair nested on the top of Sheltercliff. Another pair above old Quarry, Halton Moor, and another pair on Halton Height. Arrival, Barden Moor, second week May. Laying at end of month. Latest fresh eggs found 20th July. Apparently a day is missed between the laying of the first and second eggs.

Kingfisher.—Thinly distributed in the valley. Nesting on Wharfe and at Embsay and probably elsewhere.

Barn Owl.—Resident. Nesting in various buildings (mostly on farms) in the valley and at Barden. The scarcest of the owls.

Long Eared Owl.—Resident. Fairly frequent in coniferous woods. Found nesting in Sheltercliff and the smaller Moor Lane Plantation.

Tawny Owl.—Resident. The commonest of the owls, nesting in some of the crags and many of the woods, *e.g.*, Sheltercliff and Crookrise. Laying from last week March.

Little Owl.—Once heard Sheltercliff, 10th March, and in the Sanatorium grounds the same night.

Sparrow Hawk.—Resident. Less frequent than the Kestrel. Found annually in most of the bigger coniferous woods, some woods holding as many as seven pairs. Like the Crow, Merlin, etc., this bird is attracted by certain spots, and if a pair is killed one year it is replaced the following year by another. Nelly Park and Sheltercliff, in each of which never more than one pair is found in any given year, are typical. Laying from first week May.

Peregrine Falcon.—A Peregrine put in an appearance from time to time on our moor throughout the winter, and was variously taken for a Buzzard, Harrier and Peregrine. It was reported to feed regularly on Grouse, Peewits, etc. I got a first view of it on March 9th over Sheltercliff.

Merlin.—Non-resident. Thinly, but apparently evenly distributed. There were two or three pairs on Embsay and Barden Moors, and two pairs on the Barden Fell half of the

estate. They are very fond of certain sites for nesting. On Gill Beck nineteen pairs were trapped in one old patch of heather in nineteen successive years. On Cracoe Fell, on a similar area, twelve pairs were killed in twelve successive years. The burning of the ling in both instances terminated the run. Settling down on nesting site second week April. Laying about first week May.

Kestrel.—Resident. Evenly distributed and nesting in most of the crags and quarries, used and disused, and in barns, where it is fond of scaffolding holes. At Bolton, also in Oak trees. Laying first week May.

Comorant.—A Cormorant was seen on the Low Dock on the 5th August diving for some time. It subsequently flew off to the High Dock.

Grey Geese.—Flocks of Geese of unknown species (the birds always flew too high for identification) were seen from time to time always travelling S.W., January and February. Also on Thorpe Fell, July 20th.

Mallard.—Resident. Nested in small numbers on various streams and on High Dock, where some years quite plentiful (Fletcher).

Common Teal.—Two or three broods seen but no nests found. Nesting High Dock, Low Dock, Barden Beck and Wharfedale.

Wigeon.—Birch is certain that these birds have nested for a year or two on Barden Beck, below the Low Dock. He reported them again this year but they were only there from time to time and apparently did not breed. I saw them once, but from too great a distance to identify. They certainly could have passed for Wigeon; one received a fleeting impression of a small grey duck with a black and white undersurface.

Shoveler.—A male Shoveler was seen on the Low Dock on the 5th August.

Heron.—There used to be a small colony near Gargrave. A single nest occurred this year in one of the small woods adjoining Bolton Woods. Herons are seen from time to time on the moors and frequently on the Low Dock, feeding. Peewits and Curlews always molest these wanderers.

Woodcock.—More common as a nesting species than generally admitted, and without doubt increasing annually. In Autumn more evident and often shot on Grouse drives.

Common Snipe.—Frequent in the grassy and damp areas on the moors. Less frequent in the vale. Favourite nesting sites are the various bogs. These are unfortunately much frequented by sheep and the eggs suffer throughout the season by being walked on. Laying from mid-April.

Dunlin.—A cock was displaying to his hen on the bank of

the Embsay reservior late in May. It was my last visit to this reservior and I saw nothing more of them. A pair nested on the High Dock in 1916, and again in 1917 (Birch).

Redshank.—Several pairs nested in the neighbourhood of the Embsay reservoir. Unknown elsewhere.

Common Sandpiper.—Common on the reservoirs and some of the streams and on the Wharfe. Arrival from mid-April. Two were seen 28th February in the vale. Laying from mid-May. First departures, mid-July.

Curlew.—Began to arrive on the moors from the 23rd March. Single bird, 14th February (Birch). Laying in the vale, earlier than on the moors, mid-April. Thinly spread over the moors. Favourite nesting sites the grass covered Stank, the high pastures in the vale and the pastures by Stony Bank Wood. Began to leave mid-July.

Golden Plover.—Nests confined to the burnt patches of the moors, only the largest of which held more than one pair. Began to arrive 11th February. A few laid about the 7th April, when a spell of wintry weather drove all the Golden Plover down to Wharfedale. Not one was seen on the moors from the 11th to the 30th April, when they returned and soon laid. They were the earliest of the Limicoline birds to show signs of departure in July.

Peewit.—Occasional in winter. Began to turn up in some numbers from 10th February. Laying from first days April. Abundant on the moors, mainly on burnt patches, and on the coarse grass meadows of the vale.

Greater Black Backed Gull, Lesser Black Backed Gull.—Both species seen almost daily in April, from the second week onwards, passing up the vale in small numbers, often singly, but always from the direction of Skipton, *i.e.*, from the south-west. A pair of the Lessers hung about the Low and High Docks till May 16th, when one of the birds died and the other cleared off. In 1919 two pairs stayed on the High Dock mixing more or less amicably with the Black Headed Gulls till well into May but did not stay to breed.

(To be continued).

——: o :——

A writer in a contemporary is asking for information as to the recent status of the Goldfinch in Yorkshire, and he will be pleased to collate any notes sent to him. It would probably answer his purpose if he consulted the recent issues of a journal called *The Naturalist.*

Mr. G. W. Lamplugh's presidential address to the Geological Society of London, on February 21st, 1919, on ' The Structure of the Weald and Analogous Tracts,' was printed and distributed about the same time that Mr. Lamplugh gave his second address on February 20th, 1920, when he dealt with the areas in England which were covered by glacial deposits to a depth below sea level. Mr. Lamplugh's address for 1919 is presumably reprinted from the Quarterly Journal of the Geological Society.

YORKSHIRE ZOOLOGISTS.

WALTER GREAVES.

THE gathering of the vertebrate zoologists of the Yorkshire Naturalists' Union on February 21st at the Leeds Co-operative Field Naturalist Club's room, in Albion Street, was larger than at any other meeting during the war period, and reached the excellent standard of those in pre-war days.

The sectional meeting was preceded by one of the Wild Birds and Eggs Protection Committee, at which Mr. W. H. St. Quintin, J.P., presided.

Here the arrangements already made for watchers at various points were confirmed, and a discussion on bird protection generally ensued with particular reference to the lapwing or green plover, in the interests of which it is proposed to seek the co-operation of the Farmers' Clubs throughout the West Riding this spring.

Mr. A. Haigh Lumby took the chair at the section meeting, at which the nesting of a robin at Harrogate and of a waterhen in the Bradford area, although earlier than normal, were not surprising records in view of the remarkable spell of mild weather. Mr. J. H. Lumb, Halifax, exhibited the skins of the blue headed and grey headed wagtails which many years ago were obtained in the Halifax district (described in ' Birds of Yorkshire '), now the property of the Scientific Society, to which they were presented by Mr. A. Crabtree.

The ' Notes of a Naturalist in West Africa,' proved how splendidly Mr. S. H. Smith, York, had turned his opportunities to account, and his narrative of the wild life of that part of the world known as ' The White Man's Grave,' Sierra Leone, 4000 miles from Liverpool, was intensely interesting. He dwelt on both vertebrate and invertebrate life, but it was the vertebrates that appealed most. Lizards were very numerous, and useful too in view of the abundance of insect life. The chameleon was fairly common, the largest he saw being 10 in. long. He induced them to change by placing them on different colours of cloth. It is a rapid performance, but the reptiles tire of it after a quarter of an hour and take no further interest in the proceedings. Natives have a terrible fear of them. Iguanas occur fairly commonly in swamps, growing to 2 ft. 6 in. and 3 ft. long. In the rivers crocodiles are numerous, and no little skill is required, because of their protective devices, to detect them. Generally the body is submerged, and only the head protrudes from the water.

Deer were present in large numbers; two species, one about 18 ins. high, and an antelope standing 3 ft. at the shoulder, being most common. Water buck and water buffaloes occurred sparsely.

In the jungle were leopards. An animal locally called the ground squirrel, was the size of a pole cat. There were the mongoose and what he took to be the civet cat, rats were common; and besides chimpanzees were monkeys of several species.

In December, 1917, many English swallows were present, and other hirundines coming under notice were the purple martin and the crag martin. A shrike with the colouring of a magpie was common, and so were vultures, protected because of their useful service. Hawks of different kinds, one closely resembling the hobby and another the sparrow hawk, abounded, and there was a kestrel extremely like our own. Nightjars probably comprised four species. One possessing a streamer from each side of its tail, looked when in flight as if two smaller birds were following. Egrets and blue herons favoured the creeks, and in one December large numbers of curlews were in the same spots. They appeared similar to the European species, and no difference could be detected on comparing the specimens brought home, with the British birds.

On January 30th, 1918, some sandpipers were probably English. There were plenty of purple herons, and a giant kingfisher, besides a lesser black and white one and a blue one very like the British, but less. The larger ones were generally seen miles away from water. 'Flying foxes' (bats) with a 2 ft. expanse across the wings, were very common. They live in colonies of hundreds. Of the fishes the lung fish was most interesting, but another curious one the natives called 'shortnose.' Sharks commonly patrolled the coast, and dolphins sported in the rivers. Green parakeets were common, and the grey parrot with the red tail occurred, also one, not so common, minus the red tail. The hornbill, as it flew about, made a noise like the engine of a motor car. A kind of ground cuckoo, brown with a black tail, was common.

On January 17th, 1918, a yellowshank was observed. Weaver birds, honey birds and African starlings, bright yellow in colour, were plentiful, a little bird closely resembling the siskin had a pleasant song, and there were cow birds. Snakes were fairly common, but although some of them were deadly, they got out of the way when not interfered with. A large crow or perhaps a raven had black and white plumage. Fruit pigeons were exceedingly common. A little dove much resembled a dipper. The cock of the woods was like a large green parrot. The Mirabou stork did not seem common, and there was the whale headed stork; plenty of large and small terns associated with many different kinds of gulls, there were plenty of fish eagles and two kinds of woodpecker. A ringed plover seen on March 12th, 1918, was a breath from home. There were wild duck very like mallard, and teal, a shag, plenty of francolin or bush fowl and guinea fowl. Wading through a swamp disturbed a party of black rails. Numerous grey wagtails were observed on November 6th, 1918, and as they were in pairs they were evidently there on migration.

Mr. C. F. Procter, Hull, in some observations on the Reptilia and Amphibia of East Yorks., mentioned that during the last 10 years there had been a decided falling off in the frequency of the palmated newt, and not one came under his notice last season in the whole of Holderness. In a pond near Withernsea some years ago he took specimens of the great crested newt 10½ ins. long. In respect to grass snakes Mr. Procter alluded to a place which swarmed with them where there were formerly none, and they were spreading all over Holderness along the lines of the watercourses and drains. The viper did not occur at all in Holderness, and the slow worm up to a couple of years ago had never been recorded for extreme E. Yorks. At Spurn the viviparous lizard was rapidly spreading on the neck of land between the Humber and the sea towards Holderness. That they were on the increase was a pleasing feature. Mr. Procter definitely stated that the sand lizard did not occur there.

Mr. E. W. Taylor had a string of interesting notes on the trout, salmon and salmon trout, and he traced out the probable evolution of these three fishes. He pointed out that members of the salmon family showed a peculiar want of stability, differing in colour according to the situations they frequented, but never structurally. This led him to suggest that the family was a new one, and as yet the species were not well differentiated. In time the family would become more complex. Spawn, he assured, was often transferred by birds from one pond to another. Sea trout only differed from brook trout in degree, and hybrids were known between the two. The breeding habits of the salmon and trout were identical, but while both species of trout fed in fresh water the salmon did not. The trout was closely allied to the salmon trout, and allied to the salmon trout was the salmon, and it was interesting to reflect on which was the most ancient and which the most recent. His opinion was that the salmon and sea trout were originally fresh water fish. The trout he regarded as the most ancient type. All facts seemed to point to the extreme probability of a brown trout being able to convert himself into a sea trout. There seemed to be conclusive evidence that sea trout

if they could wander up stream could establish themselves there, and in a short time take on the peculiarities of brown trout. For this and other reasons he concluded that the sea trout should not be looked upon as a species, but simply as a variety of the brown trout.

For Mr. H. B. Booth's paper on the reptilia of Upper Wharfedale and Upper Airedale, see separate article in *The Naturalist.*

At the evening gathering there was a fine array of lantern slides, Mr. Smith exhibited an extensive series showing the sort of country he made his extensive observations in. Messrs. T. M. Fowler and Ralph Chislett had some splendid pictures of the stone curlew at home in Suffolk, and Mr. Chislett a further set of the merlin from eggs to flight of young taken on a Yorkshire moor. These and Mr. Riley Fortune's fine slides of a tern colony were all accompanied with interesting narratives.

The Co-operative Naturalists' Club were thanked for the loan of their lantern and special acknowledgment made of the services of Mr. Cockerline who manipulated it, and of Mr. Jasper Atkinson, who made all the arrangements. It was decided to hold the annual meeting of the Section on Saturday, October 23rd, 1920.

———o———

We regret to learn of the death of Mr. E. M. M. Smith, Hon. Curator of the Spalding Gentlemen's Society, which occurred suddenly on the 12th March. The Spalding Society owed much to Mr. Smith's enthusiasm. He was 76 years of age.

From an interesting article on ' The Australian Museum—Fragments of its early History,' by R. Etheridge, in Vol. XII., No. 12, of the Museum *Records*, we learn that the design on the seal of the Museum is the Lyre-bird. Oddly enough this has recently been suggested for the ' arms ' of a certain English Museum we know.

The *Yorkshire Post* records the discovery of an ancient stone coffin on a farm near Darlington. There were five bones in the coffin—the survival of which is due to ' partial cremation.' Yet as there are no bones of the skull it is assumed that the head was removed and put on the top of the lid when buried ! The Rev. G. V. Bullard considers the remains are ' those of a Druid, who, as a man of peace, would naturally not be buried with arms nor emblems of business.'

The Museums Journal for February—issued in March—contains a ' Report of a Conference between Representatives of the Board of Education and a Committe of the Museums Association on the proposed transfer of Museums to the Local Education Authorities.' From this it would appear that the views of Sir Martin Conway and other museum experts, as to the objects of a museum, do not coincide with the idea of the Secretary of the Board of Education (Sir L. A. Selby-Bigge.).

An assistant, ' with some knowledge of carpentry preferred,' is required for a Yorkshire Museum. Presumably a carpenter is required who will be an assistant at the museum in his spare time ! We are much surprised at the official organ of the Museums Association inserting such an advertisement. We should not be likely to see an advertisement in the organ of the Library Association, asking for ' assistant librarian able to wash windows ' ; whatever price was paid for its insertion.

At a recent meeting of the Linnean Society, ' Mr. J. S. Huxley, M.A., and Mr. D. F. Leney exhibited living specimens of sexually mature Axolotls metamorphosed into the Amblystoma form by feeding with thyroid gland, and of Urodele larvæ precociously metamorphosed by treatment with iodine solution.' This seems innocent enough, but the matter has been taken up by the daily press in such a way that one wonders whether—according to press reports—the authors are not taking upon themselves attributes of the creator.

FIELD NOTES.

BOTANY.

Lepturus filiformis L. at Skinburness, Cumb.—I gathered specimens of this grass from the sea-marsh at Grun Point, Skinburness, in August last.—W. E. L. WATTAM, Newsome.

Gnaphalium sylvaticum Linn., near Huddersfield.—In October last, Mr. S. L. Mosley and I came across several small patches of the above plant growing in a rough sloping field close to the Brockholes entrance to the Thurstonland railway tunnel. It is stated in Lees' Flora to be infrequent in the West Riding, and appears not to have been noted before for the Huddersfield area.—WM. FALCONER, Slaithwaite, 14th February, 1920.

See, however, A. Godward's record in present number, pp. 123-124.—ED.

Salix repens Linn., near Huddersfield.—This plant is also given (*op. cit.*) as being infrequent in the West Riding. In August, 1919, I found a solitary struggling specimen of it, badly galled in the new twigs and the petioles and midribs of the leaves, in Honley Old Wood. Mr. Mosley has records for two other places, Farnley and Drop Clough, but these have not been verified of late years.—Wm. FALCONER, Slaithwaite, 14th February, 1920.

—: o :—

BIRDS.

Albino Blackbird at Marsden.—A beautiful example of an albino Blackbird has been noted for over two years at Marsden ; for obvious reasons the exact locality is not specifically stated. With the exception of a few black feathers about the head, and on the upper parts of the wings, the bird is perfectly white.—W. E. L. WATTAM, Newsome.

Note on Little Owl.—On 29th January a Little Owl was found in a rabbit trap on the Warter estate and sent to me for identification. The bird was in remarkably good condition, the pelvis so full of fat that I failed to identify the sex. The stomach was full of remains of Beetles and wing cases. This is the second time the Little Owl has been reported from the Wold district, a pair having been shot at Leconfield in 1911, on 3rd and 5th October, the hen showing an incubation spot, but as no others were seen, presumably they had migrated after breeding elsewhere. Evidently the bird is extending its breeding range into Yorkshire. Whether it is a desirable addition to our avifauna is a disputed point. Keepers in Northamptonshire and Huntingdonshire say that it increases so rapidly as to become a nuisance, and

is so destructive among small birds that it has to be kept down. On the other hand, in some districts, its food seems to be entirely mice and beetles. Probably these form its favourite diet, but, like other birds, *e.g.*, the Starling, an increase in numbers makes it necessary to help itself to other food. From what I have seen of it in other counties I cannot regret the death of the specimen under discussion.—E. W. WADE.

—: o :—

ENTOMOLOGY.

Hibernating Flies.—Mr. Cuthbert Hastings recently sent me some diptera from Scoska Cave, Arncliffe; they were the fly seen early in the year on windows, like a small house fly with a reddish abdomen, called *Blepharoptera serrata* L. As he stated flies could be found hibernating in other caves we arranged a visit to some on Giggleswick Scars on February 7th. In a cave here we found numbers of the gnat or mosquito *Culex pipiens* L. Forty were taken, all females, and much lighter in colour than specimens seen in summer; also two species of fungus gnats which Mr. F. W. Edwards, B.A., kindly identified as *Rhymosia fenestralis* Mg. and *R. fasciata* Mg. Twenty of the latter were taken and a few *Blepharoptera serrata* L. Besides these flies a larva belonging to the fungus gnat group was in plenty on the walls of the cave; this it is hoped to rear to the perfect insect and, if successful, will be reported on later.—CHRIS. A. CHEETHAM.

Trichoptera, etc., in East Yorkshire.—I am indebted to Mr. G. T. Porritt for kindly identifying the following insects:—TRICHOPTERA—*Neuronia ruficrus* Scop. Bubwith, 1919 (new to V.C. 61). Mr. Porritt says that this species should be not uncommon in suitable localities. We have four recorded stations in the Vict. County History, all in V.C. 63. *Limnophilus stigma* Curt. Abundant in the Bubwith district, in September. Often taken by beating oaks (new to V.C. 61). (Previous records are Askham Bog, Bowes, and Huddersfield). *Limnophilus auricula* Curt. Also abundant in the Bubwith district, in many instances some considerable distance from water, from early May to October (new to V.C. 61). Mr. Porritt says that this species is commoner in the Selby district and perhaps at York than at any other part of Britain. It is in profusion at Bishop's Wood, Selby. (Previous records are also Askham Bog, Castle Howard, Huddersfield and Thorne). *Leptocerus nigronervosus* Retz. Bubwith, not uncommon by the River Derwent, 23rd May, 1918. This is also a local species, but Mr. Porritt tells me that it seems to occur on all the big Yorkshire rivers. It swarms on the Derwent at Castle Howard and has also

occurred on the Esk, Wharfe, etc. (New to V.C. 61). NEUROPTERA.—*Chrysopa vulgaris* Sch. Bubwith, June, 1915. (new to V.C. 61). This is the rarest *Chrysopa* in Yorkshire and the only record given in the Vict. County Hist. is from Crosland Hall, Huddersfield. *Chrysopa phyllochroma* Wesm. Skipwith, 1919. This local species is only known as a Yorkshire insect from this locality and Thorne. *Nothochrysa capitata* F. Melbourne, near Bubwith, June, 1919, by beating oaks. This insect is probably better known in Yorkshire than in any other county, as noted in the Victoria History. The York and Selby districts seem to be its headquarters. PERLIDAE.—*Taeniopteryx nebulosa* L. This early species occurred at East Cottingwith and Bubwith, the first week of March, 1919, on the River Derwent (new to V.C. 61). The only previous county record is Pickering, in February. *Taeniopteryx trifasciata* Pict. Saxton, 1919, Rev. C. D. Ash. Only previously recorded from Knaresborough, where it is common on the river. (Yorkshire Naturalists' Union Meeting, 1914). In 1916 Mr. Porritt found it as commonly or even more so.—WM. J. FORDHAM, Sheffield.

———: o :———

CORRESPONDENCE.

CAUSE OF MELANISM IN PHIGALIA PILOSARIA.

MY reply to Mr. Porritt's question (*The Naturalist* for February, 1920, page 79) is my inability to furnish any satisfactory answer. There is, however, a wider issue at stake, namely, whether a varietal form, and even a strongly marked form, does not sometimes suddenly appear in nature which cannot be explained by natural selection. In the life of Huxley, by his son, page 272, mention is made of this strange phenomenon in a letter from Huxley to Bateson, in which he writes, ' I see you are inclined to advocate the possibility of considerable " Saltus " on the part of Dame Nature in her variations. I always took the same view, much to Mr. Darwin's disgust. We often used to debate it.'

E. P. BUTTERFIELD.

———: o :———

We again learn from the editorial in *The Geological Magazine* for February that the future existence of the journal is assured and that more help is required. And we find out why ! 'The editorship is now a labour of love, at any rate in the sense that it is not remunerated. *It is hoped that this condition is only temporary.*' So that the urgent need for a great increase in the circulation, and the threat to increase the cost to a practically prohibitive figure, is in order to provide an ' editorial salary.' We don't know any other monthly scientific magazine which is not edited as a ' labour of love.' Personally we pay 2/6 each month reluctantly, for *The Geological Magazine*, and we feel that if the present aim is to obtain an ' editorial salary ' the sooner things are altered the better. There are plenty quite capable and quite willing to do the work—for after all it is not so very great—without salary, and subscribers will then have the satisfaction of knowing that if they don't get their money's worth, they get all that is possible.

Naturalist,

REVIEWS AND BOOK NOTICES.

The Heron of Castle Creek, by **Alfred W. Rees.** London : John Murray, 218 pp., 7s. 6d. net. This volume contains a number of the author's writings on nature study, which originally appeared principally in *The Standard* and which he had selected for printing in book form before his untimely death. Mr. J. K. Hudson, who contributes an appreciative memoir, has seen the work through the press. The volume contains some excellent articles, uncommonly well written, dealing with bird life, bird watching, and animal life in winter. And their fascinating freshness shows them to be the work of a *field* naturalist.

Pastimes for the Nature Lover, by **S. C. Johnson.** London : Holden and Hardingham, 136 pp., 1s. net. A series of elementary talks on various branches of nature study—intended for the young naturalist—and illustrated by rough but quite passable sketches. In the chapter on egg-collecting, the young naturalist should have been told that wild bird egg collecting is not now permitted, and under ' Where to search for eggs,' it is not very helpful to learn that ' In ordinary trees for a number of birds too numerous to give here ! ' The author also has a peculiar idea of books of reference on various natural history subjects.

Man, Past and Present, by **A. H. Keane,** revised and largely rewritten by A. H. Quiggin and A. C. Haddon. Cambridge : University Press, 582 pp., 36s. net. By the use of good thin paper an extraordinary amount of solid work appears in a readily-handled volume. It is a sound contribution to the ethnology of the world and by the aid of hundreds of references and footnotes the principal papers and books on any particular subject can readily be referred to by the student. There are fifteen chapters dealing with the Metal Ages, Historic Times and Peoples, The African Negro (1), Sudanese (2), Bantus, Negrilloes, Bushmen, Hottentots ; The Oceanic Negroes : Papuasians (Papuans and Melanesians), Negritoes, Tasmanians ; The Southern Mongols, the Oceanic Mongols, the Northern Mongols, the American Aborigines, the Pre-Dravidians, Jungle Tribes of the Deccan, Sakai, Australians ; The Caucasic Peoples. At the end of the volume are sixteen plates, each containing six reproductions from photographs of the various races of mankind, and giving an excellent idea of the facial and cranial differences between the various peoples.

Pre-Palæolithic Man, by **J. Reid Moir.** W. E. Harrison, Ipswich, 7/6 net. Mr. Moir has really disappointed us. We expected something new, but instead we have the same old stories which, from their repetition in almost every scientific journal (except perhaps *The Naturalist*), we seem to know ' by heart,' in fact we are told (p. 7) that ' *most* of the subject matter of this volume has already appeared in the pages of,'' etc., and we think for the word ' *most,*' it would probably be more correct to put ' *all.*' We also learn that without the help of Sir Ray Lankester ' the work I have been able to do in prehistoric research would never have been accomplished.' Hoo-ray, Sir Ray ! As the views in the volume were discussed in these pages on one of their previous appearances, it is hardly worth going over the same ground again. Oddly enough, two of the ' author's ' most epoch-making discoveries — the Ipswich skeleton and the chalk ' mammoth ' are not even referred to. These two particular chestnuts were evidently hot ones. The author apparently expects that his subscribers will know all about what he has reprinted, as he has not troubled to make an index. For one thing we are grateful : books of this kind usually contain a portrait of the author as frontispiece. We are spared, and as this ' volume ' is not even lettered on the back it is likely to remain for ever unmolested on the book shelf—mistaken for a Psalter or a blotting-pad.

NEWS FROM THE MAGAZINES.

Mr. C. B. Moffat contributes 'Some Notes on *Œnanthe crocata*: its character as a poisonous plant,' to *The Irish Naturalist* for February.

Particulars of the high prices obtained during the sale of the third portion of the Sydney Webb Collection, on February 10th, are given in *The Entomologist* for March.

British Birds for March is principally occupied by J. H. Gurney's Twenty-sixth Annual Report on Norfolk Ornithology; N. F. Ticehurst records a Blackbird's nest containing seven eggs. He found it in Sussex in 1903.

The Windsor Magazine for February contains an illustrated article on 'The Changing Face of England,' by F. G. Hardinge and H. G. Stokes. This refers to the coasts in the northern counties, and in parts seem familiar.

The Scottish Naturalist issued in February contains a portrait and obituary notice of the late Prof. J. W. H. Trail, and, among other items, an article 'On the Report of the Departmental Committee on the Protection of Wild Birds.'

Of interest to northern naturalists in *The Entomologist's Monthly Magazine* for March, are '*Loderus gilvipes* Klug.; a Sawfly new to Britain,' by F. D. Morice; 'Preliminary Notes and Descriptions of some European Species of *Aeolothrips*,' by R. S. Bagnall, and 'Early appearance in numbers of *Phigalia pedaria* Fb. (*pilosaria* Hb.)' by G. T. Porritt.

The Lancashire and Cheshire Naturalist for March contains 'Notes on some Beetles found as pests in Commercial Products,' by H. Britten; 'Regional Survey of the Hundred of Wirral—Vegetation Section,' by E. M. Blackwell; 'Observations on the Habits and Distribution of Bumble Bees in East Cheshire,' by F. Neave, and 'The Flora of Bolton.'

Bird Notes and News (23 Queen Anne's Gate, S.W.) states that the Tasmanian Government has refused to renew the lease of the Macquarie Island to the oil company which for years has been massacring the birds at the rate of a million and a half a year for the sole purpose of boiling them down for their oil; and this horrible slaughter is brought to an end.

Part 2 of *Discovery* is a slight improvement upon Part 1, but still has the same faults with regard to advertisements, etc.; these will doubtless be removed as time goes on. There are articles on Crystal Structure, Wars of Greek History, Number of the Elements, England and Germany in the Middle Ages, Gravitation and Light, The Stamp Act of 1765, Roman Trade Securities, and Industrial Gases. Some of these hardly seem to be *recent* 'Discoveries.'

The Vasculum for December has just been received. In future the publication will be 2s. each quarterly issue. The present number contains 'Some Winter Wildfowl,' by G. Bolam; 'Bird-Notes on the Borders,' by A. Chapman; 'Bird-Notes from the Hancock Museum,' by E. L. Gill; 'Celtic Survivals in Northumberland and Durham,' by J. E. Hull; 'The Moth and the Candle,' by J. W. H. Harrison; 'A Curious Coceid-like Midge (*Rhabdophaga pseudococcus*),' by R. S. Bagnall, and 'The Wolf [Spider] of the Shingle,' by J. E. Hull.

The Essex Naturalist, Vol. XIX., pt. 2, contains notes on 'Samuel Dale, of Braintree, Botanist,' by Miller Christie; 'Fauna of New River and Reservoirs in Lee Valley,' by J. M. Wood; an annotated copy of R. Warner's 'Plantæ Woodfordiensis,' by P. Thompson; 'A Feeding Platform of the Wood Mouse,' by C. Nicholson; 'Essex Ornithology,' by F. J. Stubbs; 'The Fairy Shrimp at Epping,' by D. J. Scourfield; 'Some Water Plants' (Presidential Address), by Gulielma Lister; 'British Rubi,' by H. Whitehead; Extracts from letters from John Brown, of Stanway, to S. P. Woodward; Reports of meetings, and Field Notes (pp. 65-144, 6/-).

Naturalist,

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
April 1st, 1920.

MAY 1920. No. 760
(*No. 534 of current Series*)

THE NATURALIST.

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

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.
The Museums, Hull;
AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, D.Sc., F.R.S., F.L.S. **G. T. PORRITT, F.L.S., F.E.S.**
Prof. P. F. KENDALL, M.Sc., F.G.S. **JOHN W. TAYLOR, M.Sc.**
RILEY FORTUNE, F.Z.S.

Contents :—

LONDON:
A. BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.
Printers and Publishers to the Y.N.U.

Price 9d. net. Prepaid Subscription 8/6 per annum.

YORKSHIRE NATURALISTS' UNION.

BOTANICAL SECTION.

Excursion to Deerhill and the Wessenden Moors, for the investigation of the Eriophorum Peat Areas, on Saturday, May 15th, 1920. Leader, Dr. T. W. Woodhead, M.Sc.

Train leaves Huddersfield (L. & Y.) at 12-27 p.m. for Meltham, returning from Meltham at 7-20 p.m.

NOTES AND COMMENTS.

LEEDS PHILOSOPHICAL HALL AND MUSEUM.

We learn from *The Yorkshire Post* that for some time past negotiations have been proceeding between the Leeds Corporation and the Leeds Philosophical and Literary Society with regard to the future of the Philosophical Hall and Museum in Park Row. In a recent circular to the members it was stated that the Society, which has been in existence about a hundred years, has in a large measure ceased to fulfil the functions for which it was founded, the causes being the changed conditions and the vastly increased educational facilities provided at the present time, the Society's lack of funds —it is no longer self-supporting—and the want of co-operation in the work of the Society on the part of its members. It was proposed on behalf of the Corporation that the Society should hand over to the Corporation the freehold of the building, which is valued at £50,000, and transfer the contents of the Museum (or the bulk of them), estimated by some to be worth anything up to £100,000, as a free gift to the citizens. In return the Corporation would provide the Society, for its permanent use, with a lecture hall, a council room, and a secretary's office in the proposed new Art Gallery and Museum on the vacant site in Cookridge Street, and endow the Society with £1,500 a year for twenty-five years.

MUNICIPAL OR UNIVERSITY ?

This proposal met with the all but unanimous sanction of the Council of the Philosophical Society, and a special meeting of the proprietary and ordinary members was called to approve of the scheme, but as the necessary four-fifths majority was not secured—not more than three-fifths of those present voting for it—the project for the time being fell through. The opposition seems to have come from those who wish the whole of the Museum exhibits to be handed over to the Leeds University. The Corporation representatives were willing to admit the claim that such geological, osteological, and other exhibits as would be specially useful for educational purposes should be transferred to the University, but contended that the main collection, embracing zoological specimens and many Grecian and Roman antiquities of considerable value, should become the property of the people of Leeds and find a permanent home in the suggested new Art Gallery and Museum. The Easter Holidays put a stop to further negotiations, which, it is expected, will be resumed shortly. Meanwhile it is probable that a number of members of the society will send a request to the President to call another meeting in order that the position may be more clearly put before the members generally.

ANOTHER SUGGESTION.

Mr. W. Hoffman Wood, in a later issue of the same paper, points out that :—As the matter now stands, each proprietor has the privilege, without any subscription, to a free entrance to the museum, and all lectures and other functions, as well as to two free tickets for friends. These rights would lapse, and the proprietors would have no other rights than as ratepayers when the 25 years expire. As an alternative scheme, I would suggest that the City Council be asked to accept a voluntary gift, free from any conditions or payment, of the contents of the museum, to be housed in the Art Gallery. The society would then sell their premises, and the money would be invested in the names of the proprietors, and used for such educational work as they decided on. Another suggestion, made some years ago, was to give the museum and the valuable library to the University, the leading educational authority in the county, in return for which the proprietors would have the same privileges they now enjoy, but on equal terms with the University students, and also the University Library and the Philosopher's Library would be combined for the equal joint use of the proprietors and the students.

PREHISTORIC IMPLEMENTS.

At a recent meeting of the East Riding Antiquarian Society, Mr T. Sheppard, M.Sc., read a paper 'On the Origin of the Materials used in the Manufacture of Stone Weapons by Pre-historic Man in East Yorkshire.' He pointed out that in this district the Neolithic or New Stone Age is considered to have ended about the year 2000 B.C., the Bronze Age ending between 1000 B.C. and 500 B.C. This being so it can be taken that the greater proportion of the stone implements found in East Yorkshire are at the very least 4000 years old. Mr. Sheppard differentiated between Neolithic stone implements and those which survived into the Bronze Age, numbers of which occurred in the barrows of the Bronze Age in East Yorkshire. In the latter cases, however, stone implements, which are usually of an exceptionally delicate nature, were apparently used for ceremonial purposes only, and could not have been used in actual warfare.

MATERIALS USED.

Mr. Sheppard exhibited an extraordinarily complete series representing typical implements from the unrivalled Mortimer Collection, which has been purchased for Hull by Col. Clarke, and he explained where the materials used in their manufacture had been obtained. Though flint is common in the Yorkshire Chalk, it was pointed out that the thousands of flint implements found on the Wolds were really made from foreign flint brought

to this country during the Great Ice Age. Of the Stone axes at least fifty per cent. were made from the volcanic ash of Borrowdale which was probably brought into this area by traders from the Lake District. Basalt obtained from the local drifts was used for the manufacture of the large battle-axes, some of which weigh as much as 8½ lbs. each. Peculiar types of battle-axes and flint arrow-heads found only in the vicinity of Bridlington were exhibited. A few beautifully made weapons were considered to have been brought over to this country from the continent in Neolithic times. Among the materials used in the manufacture of the prehistoric weapons and ornaments were Cheviot porphyrite, Grauwacke, micaceous sandstone, gneiss, diorite, quartzite, black and pink flints, quartz-porphyry, jet and amber.

MR. B. B. WOODWARD'S RETIREMENT.

We learn with great regret that Mr. B. B. Woodward, the Librarian of the British Museum of Natural History, will shortly retire. *Facile princeps* as a Librarian of Scientific Books, Mr. Woodward has completed his catalogue of the Libraries in the Museum, and has left as his monument the best account that has ever been compiled of Scientific Literature; an account which has not only served his own colleagues, but has been a guide to every other Institution throughout the world, and this because he knew the subjects he was dealing with, and was thoroughly in sympathy with systematic science. It is to be hoped that the Trustees will rise to the occasion and fill his position with some person competent to carry on his work, and not make another of those deplorable appointments from which the Museum has already so seriously suffered.

NORTHERN PREGLACIAL FLORAS.

At a recent meeting of the Geological Society of London, Mrs. Eleanor M. Reid read a paper 'On Two Preglacial Floras from Castle Eden.' The seeds examined were obtained by Dr. Trechmann from Preglacial clays, found in fissures of the Magnesian Limestone at Castle Eden. The clays were carried by the Scandinavian ice from the area now covered by the North Sea. The study proved the presence of two seed-bearing clays, of different ages, the earlier being undoubtedly Pliocene. The Pliocene age is confirmed by M. P. Lesne, who determined the insect-remains found intermingled with the seeds. While the work was in progress, material from the base of the Pliocene of Pont de Gail (Cantal) gave knowledge, for the first time, of a seed flora of known age, low down in the Pliocene; it showed that the rate of change in the character of the West European Pliocene flora was slower than had been suggested by Clement Reid and the author. A critical

comparison was made between various floras. The result proved the Castle-Eden flora to be Middle Pliocene. Therefore a study of fossil seeds had made it possible to discriminate between strata intimately mixed *in situ*, and to determine their geological age when unknown. Besides being marked by the number of extinct and exotic species which it contains, the Castle-Eden Pliocene is characterized by the absence of aquatic species, and the abundance of those growing on steep banks. From this the Author infers an upland valley, with a gathering-ground standing at least 400 feet, probably much more, above the Middle Pliocene sea-level, in an area now forming part of the North Sea.

EDUCATION OF THE EYE.

Under the above heading the following paragraph appears in the *Bridlington Free Press* :—'For a long time past the children of Hull National Schools have had a morning a week at the Hull Museum and lessons from the antiquities gathered together there. "What Yorkshire thinks to-day, England thinks to-morrow," said a statesman of half a century ago, and so it is no surprise that the British Museum has followed suit, and intelligent guides have been appointed to conduct parties of adults and children round the treasures there gathered together, of which we need only mention the Venus of Milo* and the Elgin Marbles. If education by these means proves efficacious, what possibilities does it open up? Travelling may be an education as well as change and rest, and a visit to the seaside will open up a child's mind in a way years spent over books could never do. Those who can afford it might organise parties of their children to visit Rome, Venice and Athens, and learn on the journey lessons of geography ; as on their arrival lessons in art and history will be open to them. Teachers, too, would find their profession no longer the drudgery it is, if interspersed with Continental trips and visits to interesting places.'

CHEMICAL REVERSAL OF GEOTROPIC RESPONSE.

At a recent meeting of the Linnean Society, Prof. James Small gave a demonstration of 'The Chemical Reversal of Geotropic Response in Roots and Stems.' He stated that when roots are placed horizontally in a moist atmosphere rendered very faintly alkaline by ammonia vapour they tend to grow upwards. When stems are treated in a similar way with acetic acid vapour they tend to grow downwards. These experiments form preliminary confirmation of the following theory of geotropic curvature, which has been elaborated as a

* The last time we saw the Venus of Milo it was in the Louvre, at Paris.—Ed.

correlation of previous work on the electrical conductivity of roots with data accumulated by other investigators. The outer zone of the protoplasm in the cells of the apical meristem is an emulsion with a continuous phase of colloidal aqueous solution and a disperse phase of protein or protein-lipoid particles, which show Brownian movement and carry an electropositive charge when the hydrion concentration of the continuous phase is higher than the isoelectric point of the vegetable proteins, or an electro-negative charge when that hydrion concentration is lower than the isoelectric point of the proteins. The continuous phase or medium in the root is relatively acid and that in the stem is relatively alkaline. Creaming of the emulsion under the influence of gravity causes differences of potential in the apex of root and stem, which produce electric currents. These produce differences in permeability, turgor and rate of growth. The direction of these currents is determined by the positive charge in the root and the negative charge in the stem with corresponding downward or upward curvature.

EXPERIMENTS ON ROOTS.

The reversal of curvature in the experiments is due to the reversal of the electrical charges on the particles of the disperse phase, which is caused by the changes in the relation of the hydrion concentrations to the isoelectric point of the proteins. This theory explains practically all the details of known geotropic phenomena, including the orientation of the secondary and tertiary branches of roots and stems. It has very wide applications to cytolysis, the stimulus/response ratio of the Weber Law, acid-tolerant and calcifuge species, immunity from and liability to attack by bacteria and fungi, the development of intumescences, the effects of acids, alkalies and salts on plants and animals in general and on the permeability of protoplasm in particular, and possibly also to epharmonic variations. It provides an explanation, not only for the normal polarity of growth in the plant, but also for the changes in geotropic response and in colour which occur in flower-buds and other organs. Indications have been obtained that the CO_2 balance in stem and root is the chief factor governing the differentiation in hydrion concentration, and also that phyllotaxis can be explained in terms of the potential differences postulated.

STRONGYLOGASTER SHARPI.

In *The Entomologist's Monthly Magazine* for April, the Rev. F. D. Morice records *Strongylogaster sharpi* from various localities in the Tyne district. It was originally described as new to science in 1879 on the strength of specimens from Dumfriesshire, and has not been seen again until the Tyneside

specimens were secured. This is all very interesting, but the question of nomenclature comes in, and we read, 'assuming that *struthiopteridis* has been correctly referred to, it seems that the proper "Generic" name of Cameron's [Dumfriesshire] insect will not be *Strongylogaster*, nor (as suggested provisionally) *Pseudotaxonus*, but *Hemitaxonus* Ashm. Since, however, it was described before *struthiopteridis*, its "Specific" name will still be *sharpi*, whether or no the two insects be identical.'

PROTOZOA.

In a well illustrated article in *Science Progress* for April, on 'Heredity and Evolution in Protozoa,' Prof. R. W. Hegner concludes that the investigations he describes 'all prove that in five species of Protozoa (*Stylonychia pustulata, Difflugia corona, Centropyxis aculeata, Arcella dentata*, and *A. polypora*) heritably diverse branches may be isolated from the descendants of a single specimen obtained by a sexual reproduction. These heritably diverse branches resemble the diverse strains that in each case were shown to exist in nature. The latter may probably have originated in nature in a similar manner. The chromatin-cytoplasmic studies of *Arcella dentata* and of *A. polypora* are of particular interest because they deal with the internal changes that accompany the differences in external heritable characteristics. The correlation of these external heritable characteristics, with the quantity and distribution of the chromatin within the cell, is a considerable step forward in our knowledge of the method of evolution. These researches, however, leave many interesting problems for future investigations, but 'to travel hopefully is a better thing than to arrive, and the true success is to labour.'

INVESTIGATION OF YORKSHIRE RIVERS.

The Yorkshire Geological Society is anxious to continue and extend during the summer of 1920 the study of the Yorkshire Rivers upon lines which in America have been productive of so much scientific interest in the hands of American geologists. To this end it desires to enlist the aid of all students of the sciences concerned in such a survey, whether members of the society or not. As a precise knowledge of the tectonic structure of the country is of fundamental importance, since the 'build' of the country must have affected the origins and evolution of the rivers, workers are invited in the first instance to record with precision and fullness:—1. The dip of the rocks in their respective areas (dips in shale are more reliable as guides to the tectonic structure than dips in sandstone). 2. The faults, their situation, the direction and amount of their 'throw.' 3. The direction of the dominant jointing of the rocks. If magnetic bearings are given the date of observation should

be added. 4. Details revealed by boreholes. 5. Unpublished evidence of glaciation. 6. Sections, temporary or otherwise, of superficial deposits—gravels, lake-muds, etc. 7. The heights attained by floods (with dates).

CO-OPERATION OF FIELD NATURALISTS.

The promise of the co-operation in the investigation of many students of natural history has been received through the Yorkshire Naturalists' Union, and other bodies. The officials of the West Riding Rivers Board have promised assistance and information with regard to rainfall. Members of the Yorkshire Naturalists' Union suggest that notes should be made on the plants and animals of the river valleys, showing the influence of altitude, rock-type, contamination of the waters, the effects of the woods and plantations upon the rainfall, and other questions bearing upon the investigation.

ADULT EDUCATION IN BRADFORD.

The Bradford Director of Education (Mr. A. C. Coffin, B.A.) has submitted a memorandum to the Education Committee of the Corporation regarding adult education. He states that in Bradford there are upwards of 30 literary, scientific, musical and art societies, with an average membership of about 200 in each society. He suggests the formation of an Adult Education Advisory Committee, and the granting of financial aid to all those societies who undertake to increase their activities by forming study circles, popular sections, or otherwise, and who submit satisfactory programmes of work. He also recommends the establishment round the city of about five centres, in selected school halls, where, on successive nights in each centre, art, music, literature, science, history, and geography should be dealt with in the most ' popular ' form, and profusely illustrated with lantern slides and performers in the ' entertainment ' manner.

——:o:——

In answer to numerous correspondents we should like to say that the reference to the deer on page 137, as occurring in West Africa, should, of course, have been ' antelope.'

Part 3 of **A Geographical Bibliography of British Ornithology** (Witherby & Co., pp. 193-288, 6/- net) completes the first half of this useful work. It deals with the literature of the Counties Middlesex to Surrey, and each county seems to have been dealt with as thoroughly as in the previous issues. The Northumberland chapter seems particularly complete and interesting.

The Buzzard at Home, by **Arthur Brook.** (Witherby & Co., 15 pp. and 12 plates, 3/6 net) is headed " British Birds, ' Photographic Series,' " and appears to be an article slightly too long for our contemporary —so it has been published separately—though for the text—interesting as it is—and the twelve plates—beautiful as they are, 3/6 seems rather ' stiff ' even in these times. The photographs were taken in Wales.

ABNORMAL INFLORESCENCE OF HAZEL.

ROGER W. BUTCHER.

About a month ago I found in the neighbourhood of Leeds a Hazel tree on which the female flowers were developed in the male catkin. The female flowers were generally at the base of the catkin, but sometimes as much as half way up the axis, and there appeared no definite order. There were also large numbers of normal flowers (both male and female) on the same shrub. All the scales were alike and in most cases there were three female flowers in each scale (see fig. 2), but in about three examples, and this (as far as I could see) when the female was situated towards the middle of the catkin, there was

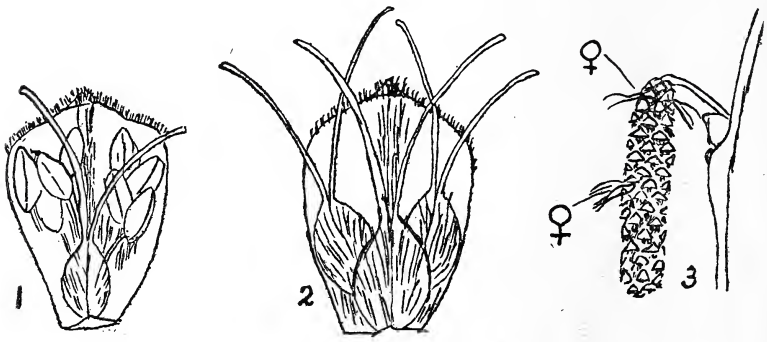


Fig. 1.—Bract with male and female flowers.
,, 2.—Bract with female flowers only.
,, 3.—Catkin with male and female flowers.

one male and one female flower in the same bract (see fig. 1). Otherwise the tree seemed normal.

This phenomenon appears rare in the common Hazel (*Corylus Avellana*) and the last record known to me was in April, 1918, near Birmingham (see *Nature*, April, 1918, p. 126). In my case there was no differentiation of the bracts, and the female flowers were not always at the base. The district where found was a stoney wood near Meanwood, Leeds.

——: o :——

By the publication of Part IV., on March 31st (pp. 115-164, 4/-) of **A Synoptical List of the Accipitres** (Diurnal Birds of Prey), Mr. H. Kirke Swann completes a work which will undoubtedly prove of service to the systematic worker. We fear that it must have been an 'arduous and unprofitable undertaking,' as things are to-day, but *The Naturalist* appreciates Mr. Kirke Swann's enthusiasm and trusts that those readers who can help by buying the list will do so.

BIRDS OF THE EASTBY DISTRICT, YORKSHIRE.

W. ROWAN, B.Sc., M.B.O.U., WINNIPEG.

(Continued from page 136).

Black Headed Gull.—Some 40 to 50 pairs bred on the High Dock. Owing to their failure to turn up the previous year they were unexpected and hence unmolested. Half nested on the grass hummocks of the 'Duck Ponds,' others on the heather-clad cliff at the far end of the reservoir and at its base. One nest was on the tip of a stone wall. When all the young were flying there were about two hundred birds, so that the colony evidently did well. Arrival last week April. In 1919, however, the birds had full clutches by that date and were sitting. There were also about twice the number. On one little island of about 9 square yards, there were 28 nests.

Corncrake.—Varying annually in numbers. This year was said to be a bad one. As usual all the nests were confined to the hay meadows. Arrival second week May.

Moorhen.—Only noted on the High Dock where two pairs nested amongst the gulls, and in the vale at Embsay.

Stock Dove.—Not common, but nesting in several of the crags and quarries.

Wood-pigeon.—Resident though by no means common in the winter round the moors. Nesting abundantly in all the woods right up to the moors. Laying began 2nd week April. Second sittings general in early June.

Rock Dove.—Seen 1st and 2nd May (four and one respectively) on the Halton Moor Quarry. The white rump was unmistakeable.

Turtle Dove.—Early in May one was shot in Halton East by a farmer on his wheat and sent up to me for identification as the bird was unknown to anyone in the district. It proved to be a female almost ready to lay. Another one was seen the following day in the same field. This appears to be another new addition to the ever extending range of this bird.

Pheasant.—Resident. Occasional in the woods and on the moor. Reared prior to the war in Wharfedale from Jamie Park downwards. A pair nested in Nelly Park this year and another pair in the middle of the moors on an old patch of bracken.

Partridge.—Resident. Common all round the edge of the moors in the rough pastures. Also in the vale.

Black Grouse.—Nearest known breeding birds at Flasby (Clark). Occasional in the woods around Embsay and Barden

moors. Two birds were seen this winter, one being put out of Crookrise on the occasion of the Fox-drive on Sunday, 17th February. Two years ago there were five birds in Broad Park all winter (Birch). These may have been bred locally.

Red Grouse.—Resident and abundant on the moors. Pairing from Mid-February. Laying from third week April. Found a bird at Low Dock still sitting in the last week of May.

There are a few birds that have not appeared on the above list that call for comment. The Crossbill, for instance, has been recorded for the district on more than one occasion. It has not only occurred, but has nested in the big plantation at the foot of Barden Fell. The young were shot in that wood. The Short Eared Owl has also bred more than once in the area. Young were found only five years ago by one of the keepers (Esherwood). The last record before that is more than twenty years old.

The Wood Lark was reported to nest by many people, but it turned out that this was the local name for the Tree Pipit. The latter is very abundant while the former was neither seen nor heard.

The absence of the Gold Crest and the Long Tailed Tit, both of which are well-known nesters in the district, was probably owing to the effects of the winter of 1916-17. Even at Bolton Abbey they were wanting.

Curious also is the absence of the Yellow Hammer and the Chiff Chaff. Both of these common birds seem to be unknown locally. The appearance of the single Chiff Chaff on April 14th seems to have been most unusual.

In past years some unusual birds have been got. Amongst these are the Hooded Merganser, Scoter, Common Tern, Gannet, Storm Petrel and Golden Eagle. Birch tells me that his father recalled the attempted nesting of Ravens at Rilstone Cross.

In conclusion a remark *re* the supposed occurrence of the Water Pipit. On Jan. 22nd, whilst out for a walk on the moor I almost walked into a Pipit. It flew a few feet and then settled again. I followed, and we repeated the procedure a number of times so that I had some excellent views of it. Larger than a Rock Pipit, with an almost uniformly coloured back; chin, breast and belly almost white, with a few fairly bold markings on the breast, it was certainly no Tawny Pipit, and could, I think, have been nothing but a Water Pipit.

——: o :——

In ' Leaves from an Alston Notebook,' published in the *Mid-Cumberland and Westmorland Herald* on March 27th, Mr. George Bolam writes on ' Which is our most useful bird,' and favours the Nightjar.

THE NATURALIST AND THE GARDENER.

WILLIAM G. SMITH, B.Sc., PH.D.

(*Continued from page 132*).

Hybridisation has proved an effective agent used by the gardener to secure new forms, and what has been learned in the garden is a useful guide to the naturalist. The British 'Flora' includes numerous reputed hybrids, yet few of these have been tested by modern methods. A recent enumeration of the natural hybrids of the British flora* extends to eighteen large pages of names alone. To test even a few cases offers a field for investigation of a kind more suited for the garden than for natural conditions. The fundamental facts of hybridisation may now be found in many text-books, and are not repeated here. The process is best studied by actual observation after the necessary experimental work, and the naturalist who will carry out the hybridising of two distinct varieties of some easily grown plant will soon grasp the primary essentials, and will probably open the way to some interesting puzzles. Cross-pollination is the beginning of hybridisation. In the Cabbage family, cross-pollination prevails, so that no experienced gardener will allow one variety of cabbage to flower near another. Similarly with Turnips. This was the subject of a searching investigation by A. W. Sutton.† The results of crossing cabbages were mainly nondescript mongrels of no economic value, and the author concludes that the present garden varieties are more the result of selection than of hybridisation. Crosses between cabbages and turnips yielded no seed, but turnip crossed with swede gave results which support the view that these are two distinct species. One of my summer pastimes for twelve years has been the observation and hybridising of cereals, especially varieties of Barley. The cereals lend themselves to garden observations because they are mainly self-pollinated. The pollen passes from the stamen to the stigma before the enclosing chaffs open, so that by the time the stamens show externally, they are almost empty of pollen and the ovary has already begun to develop into a grain. Self-pollinated plants are thus easier to deal with than insect or wind cross-pollinated ones which must either be flowered widely separate, or the inflorescence must be protected by cloth covers which in our climate too often favour moulds and thus spoil the experiment.

* R. J. Lynch, *Jour R. Horticultural Society* (Genetics, Vol., 1906).

† 'Brassica Crosses,' *Linnean Soc. Jour. Botany*, XXXVIII., Oct., 1908.

1920 May 1

As regards native wild plants, time will not permit of more than a passing reference to two series of experiments on hybridisation by Professor F. E. Weiss (Manchester); these will illustrate what might be done in a Yorkshire garden. Botanists in some districts are familiar with *Geum intermedium*, which Babington (1904) refers to as 'perhaps a hybrid,' but Hooker (1870) says was reproduced as a hybrid by Bell-Salter. The name is descriptive, for the variety shows a great range of flower colour and shape between Water Avens (*Geum rivale*) and Hedge Avens (*G. urbanum*). F. E. Weiss* found that the petals of *G. rivale* contain a red sap, while *G. urbanum* has yellow plastids. The first crop of seedlings (F1) from the cross were intermediate as regards colour, but the next generation (F2) yielded plants with red, others with yellow, and still others with white flowers. The white petals had neither red nor yellow colouring matter, and the same result has been observed in other hybridised plants, *e.g.*, Sweet Pea. The pairing of other characters was followed out in the same way, and the evidence of controlled experiment shows with certainty that *Geum intermedium* is a true hybrid of the two native species. Another case examined is the Scarlet Pimpernel.† There are two well-marked varieties (or species), the familiar deep scarlet Pimpernel with red sap in the petals, and a less common blue one (*A. coerulea* Schreb.). Reciprocal crosses (*i.e.*, 'red' pollen × 'blue' stigma, and 'blue' pollen × 'red' stigma) all yielded red flowers in the first generation of seedlings, so that red is dominant over blue. In the next (F2) generation there was complete segregation, and the plants bore either scarlet or bright blue flowers; no intermediates were observed. An extension of the work was to test whether a third variety with salmon-coloured petals (*A. carnea* Schreb.) was a hybrid or not; the evidence was adverse to the hybrid theory.

The present state of knowledge is such that the designation 'hybrid' is not permissible without proof, and it should be limited to cases which have been tested. If it seems advisable to suggest hybrid origin, where a variety seems to show characters of two parents, then some such expression as 'reputed hybrid' should be used. The simpler tests of hybrid origin can in many cases be carried through in a year or two, according to the time each generation takes to flower. Meanwhile as a denizen in the garden the plant will be under observation as to growth and behaviour, and the observant naturalist may be able to add new facts to our scanty knowledge of

* *Mem. and Proc. Manchester Lit. and Phil. Soc.*, 36, pt. 1.

† F. E. Weiss, 'Colour Inheritance in *Anagallis arvensis* L. British Association, Sect. K., Sheffield, 1910.

native plants. Two methods of procedure are open—to repeat the cross, or to save seed from the wild plant of the suspected hybrid and sow it. Before repeating a cross, it is necessary to know from observation that the parent plants are 'pure lines,' that is, they come true to type from seed. During this period preliminary trials will show when and how to transfer the pollen. When the cross has been made and seed saved, the next (F1) generation will either yield a series of intermediates, or the dominance of one or more parental characters. If the dominant character comes from the pollen parent, then the evidence for a hybrid is secured in the first generation. Seed from F1 is sown for F2, and here every possible type will appear if there are enough individual plants. Amongst these there ought to be specimens similar to the reputed hybrid. The other method is to save seed from a suspected hybrid and to sow it: if there is segregation, that is several distinct types or intermediates, then in one trial the needful proof of hybrid origin is secured. A preliminary trial with the 'seed-plums' of the garden potato is recommended for gaining experience, for most potatoes are hybrids and segregate freely. This method may be misleading unless precautions are taken to prevent cross-pollination by insects. There is also a possibility that no segregation will occur even though the parent plant is a hybrid. These simpler tests are not exhaustive, but it is a fair assumption that if native 'hybrids' were tested in these ways, it would furnish valuable evidence for or against.

In conclusion, it has been my purpose to show that out-door natural science is not exhausted in the sense sometimes voiced by the blasé naturalist. The garden and the gardener's hard-won experience have been suggested as worthy of the attention of the 'wild' naturalist. This is not a universal panacea, but it is an addition which the naturalist may use with profit to his studies in the open. Much of the interest of the 'microscopist' is maintained by the quiet hours indoors with his micro-specimens, microscope and works of reference, and a perusal of *The Naturalist* will show that it is in the microscopic branches that local knowledge is still progressive. The 'phanerogamic' naturalist may also bring new resources into action. In the garden he will find opportunities for maintaining his interest in plants throughout the weeks when duty or climate prevent him from going further afield. It is after all the individual naturalist that matters. If the members individually retain a keen enthusiasm, then the Yorkshire Naturalists' Union will be progressive, because the constituent Societies will be active both in the field and in the winter meetings for discussion.

—o—

The date of the British Association Meeting, at Cardiff, is August 24th to 28th.

1920 May 1

SONGS OF THE BIRDS.

X.—The Ring-Ousel's Rondo.

A slope of Haytor where the buzzards scream,
Two lonely thorns beside a boggy stream,—
Here a Ring-Ousel piped his prattling theme
To heath and fen.

Pee, pée!— Pee, pee, pee, pée!—Pee, pée!
Bequée, Bequée! Tuée, Tuée, Tuée!
CHIURRA-KAROO-KAROO! Pee, pee, pee, pée!
Then o'er again!

Surely some chuckling linnet in the bush
That *intermezzo* fired, with its wild rush
Of falling tones,—not this primæval thrush,
Unversed in art?

Yet hark!—*Tsee-chíkaroó-karóo-karóo!*
As when the Brown Thrush decks his own song too
With downward-chiming *Tirra-lirra-loo*,—
Sweet counterpart.

Approached, *Chak-chákka-chákka-chák*, he said;
And then with *Chak! Chak! Chak!* away he fled.
To th' old clan-cry our Ousel, then, is wed,
When foes alarm!

Adventurous singer, tardy comes the praise
Of you who first made music of that phrase,
And turned fear's cries to laughter in your lays
Of Doric charm.

WALTER GARSTANG.

—o—

Spring Song.

Pan is awake, and piping through the woods;
Winter is past.
Nature, new-green in all her bursting buds,
Rouses at last.

Softly the call of Spring comes to the ear
Of beast and man,
And all the myriad flowers wake to hear
The pipes of Pan.

S. MATTHEWMAN.

Naturalist.

BIRD NOTES FROM WHITBY,

F. SNOWDEN.

THE Golden-Crested Wren, which appears to have been altogether absent from this district since the disastrous winter of 1916-17, has become thoroughly re-established. Recently I have seen and heard it in many of its old haunts. However the Long-tailed Titmouse suffered in other parts of the county in the winter of 1916-17, it was certainly not altogether banished from this district where it has always been fairly numerous. During the last three years I have from time to time observed the usual small parties, and last winter met with a flock.

After the autumn migration the Pied Wagtail is seldom observed here. Now and again, odd birds may be seen during the winter, but some years it is not noticed at all. Occasionally it turns up before the close of February, but the second week of March usually brings the earliest of the spring migrants; these flights being—so far as my observation goes—invariably composed of males; females generally not appearing until two or three weeks later.

For several years—since the winter of 1913-14—the Waxwing has not been observed in the Whitby district, until March last, when a single bird was under observation at Sleights for about a fortnight. The species is partial to the 'hips' of the rose tree, and this bird came close to the houses in the village to obtain them.

A flock of upwards of twenty Siskins frequented a garden about three miles from Whitby from the beginning of January until about the 7th of April. Almost daily they were observed feeding on the ground beneath some cypress trees. This interesting little finch is not often noticed here, and none have been noted since the winter of 1910-11, when there were a fair number about, of which, unfortunately, the bird-catchers secured a few.

The Brambling has been much in evidence during the past winter. I have never known it more numerous here.

Some time ago a Sparrow-hawk was killed by flying against a window of Raithwaite Hall, the seat of Mr. W. H. S. Pyman.

The Shag, which is an irregular winter visitant to this district, has been with us in small numbers during the past winter. Immature birds arrived towards the end of October, frequenting the harbour daily during the latter part of their stay. The majority appear to have left by the end of March, a single bird only being seen so late as the 16th of April. The flocks of Common Scoters which usually are found on our coast in winter have not been seen during the late season. Odd birds only were observed in October.

One of our most interesting winter visitants—the Purple

Sandpiper—is generally to be seen about our piers from early in November to the latter part of April. Last Spring it remained as late as 13th May.

An adult Fulmar was found dead on the beach here on the 9th December.

During the glorious summer-like weather which prevailed at the latter part of March, the Chiff-chaff had arrived on the 23rd, and the Wheatear on the 26th, the earliest dates on which I have known these birds to be recorded here.

Quite recently a Great Grey Shrike has paid us a visit. I first noticed it on the 13th of April, and also had it under observation on the three following days.

——:o:——

The Adventive Flora of Tweedside by **Ida M. Hayward, F.L.S.,** and **G. C. Druce, M.A.** Arbroath: T. Buncle & Co., 1919. pp. xxxii. and 296; 10/6, with 79 illustrations from photographs. This is a very welcome addition to local British Floras, and botanists who have spent many pleasant hours on the waste heaps of the West Riding and elsewhere, will find in this flora a work they have long needed to assist in the determination of the puzzling introductions from overseas. In a chapter of 15 pages a history of Galashiels is given to show the time, sources and modes of introduction of the alien flora of Tweedside, which is shown to be closely linked up with the history and development of the woollen industry. Among the interesting features in the body of the work are the derivations of the generic names of the plants, the addition of popular names where possible, references to published plates of the species, the distribution of the species over the world, and detailed botanical descriptions. Considerable numbers were found on Tweedside for the first time in Britain, many new to Europe, and a few new to science. Several have not yet been found in their native country. The more interesting of these are illustrated by photographs, chiefly from herbarium specimens, and the frontispiece shows the picturesque habitat of these aliens at the junction of the Gala and the Tweed. There are also excellent photographs of the hooked, spiny and pappose fruits showing the mode of attachment to wool and skin. As in the West Riding, many aliens do not survive the winter, and some seeds transported fail to germinate. Doubtless many are destroyed in the washing and carbonising processes and this may account for the small number of Labiates. A large number, however, survive, and it is suggested that in the case of Chenopods it may 'afford the necessary stimulant' to germination. *Senecio latus* is one of the few Australian species capable of surviving the Scottish winter. This flora contains many details of biological interest, and many striking peculiarities of distribution occur, *e.g.*, among the 36 species and varieties of Chenopodium found at Tweedside, two, *C. hircinium* from the Argentine, and the Indian *C. striatum*, produced a hybrid, which Miss Hayward discovered at Galashiels, and this Dr. Murr has named *C. Haywardiae*. One conclusion reached in the study of aliens is that of the large number introduced, very few establish themselves as permanent elements in the flora, and as a result of modern methods for the utilization of waste produots and the more drastic treatment of trade effluents, we may expect fewer foreigners of this type in future. The work, which concludes with a long list of aliens other than wool-introductions, is appropriately dedicated to Dr. A. Thellung, of Zürich, whose extensive work is known to readers of this journal. It is a book to delight the field botanist, and the authors are to be congratulated on the successful completion of many years of intensive study among the aliens of Tweedside.

HERPESTES ALBICAUDA AND THE GENUS BDEOGALE (OF PETERS).

FREDERICK D. WELCH, M.R.C.S.

Among the Mungooses which inhabit the African mainland there are two of especial interest scientifically. One of these is the large *Herpestes albicauda* of G. Cuvier, skulls of which measures from 9.5 to 11 centimetres in basal length, ranging from East Abyssinia to Natal, and through to Gold Coast, Guinea, Angola, the general colour being blackish grey, with feet black. The peculiarity of it is that the bushy tail is of Dimorphic Coloration, white in some specimens, black in others (as in the specimen described by Temminck, in 1853, as a distinct species from *H. albicauda* with the name of *Herpestes loempo*). The two forms are, however, *not distinct species*, as was proved by Mr. O. Thomas in 1882 when he wrote, ' No one, however, ever seems to have noticed that the black-tailed *H. loempo*, Temm., is not even specifically distinct from the typical form, and therefore, of course, possesses all its more important structural characters. *H. albicauda* and *H. loempo* cannot even be separated as varieties, for the only difference between them, namely the colour of the tail, seems to be purely an individual variation.' Later on, ' In the British Museum we have two specimens from the Bogos country, Abyssinia, received together, and the skulls of which are quite identical, one of which has a black *loempo*-like tail, and the other has a tail with quite as much white on it as in average *albicauda*.' He also mentions ' a specimen from Accra, on the Gold Coast, which has a regular white tail just as in the typical *H. albicauda* ' (*see Proc. Zoological Society*, 1882, p. 77). Black-tailed and white-tailed specimens both, therefore, come from the *same* locality ; and since Mr. Thomas's remarks were written, I have myself seen two specimens from Chak Chak, Bahr-el-Ghazel, one with white tail, the other with black (Museum numbers 7. 10. 2. 3. and 7. 10. 2. 5).

In length both measure 22 inches head and body, tail 18, which proves that the different colour of tails is *not* in any way the result of different sizes (some mammals alter normally in coloration as they pass from young to adult). But the most interesting fact, to my mind, is that *both these are males*, which again proves that the different coloration in tails is *not sexual*.

Herpestes albicauda is, of all the *Herpestes* genus, most nearly allied to the true *Bdeogale*, resembling the species of that four-toed genus in quality of fur, length and bushiness of tail, large size of last molar and the presence of median

1920 May 1

middle external cusp to last lower molar ; and it is in the genus *Bdeogale* that the other Mungoose afore-mentioned occurs, the interest of which again lies in its coloration.

This is the *Bdeogale nigripes* (of Pucheran) from the Gaboon, described in 1855, which shows an extraordinary colour resemblance to the white-tailed specimens of *Herpestes albicauda*. In order to show this more effectively, I am quoting Mr. O. Thomas's words *before* he had seen a specimen. ' With regard to *Bdeogale nigripes* Puch., from the Gaboon, I have already mentioned my suspicion that it has accidentally lost the first toes on all four feet ' (the *Herpestes** Mungooses, of different species, lose these toes occasionally).

' The original description would *exactly fit* ' (italics are mine) ' the Accra white-tailed specimen already referred to ' (see fore part of account of mine), ' and that is certainly a true *Herpestes*, as the fifth toes are present on all the feet.' In an interesting account of the mammals in the Gaboon-Cameroons forest (*Proc. Zool. Soc.*, 1905), we are told that this Mungoose, like *Herpestes naso*, ' is found in the forest in swampy places or near streams ' (p. 76), different from sandy parts where *H. albicauda* is commonly met in its white-tail form.

In *B. nigripes* there is *no* double coloration of tails as in *H. albicauda* ; and it is curious, as a contrast, to notice that the species from East Africa, *Bdeogale crassicauda* and *B. puisa*, from Mozambique (*Proc. Zool. Soc.*, 1882, p. 81), and *B. tenuis* from Zanzibar Island (*Proc. Zool. Soc.*, 1908, p. 168), have *dark* tails, last-named species tail black. Will the Island species show a Dimorphic Coloration in tails, when more specimens are collected?

——: o :——

The Journal of the Board of Agricultiure, Vol. XXVI., No. 8, contains the ' Prime Minister's Address to Agriculturists.'

At the Annual Meeting of the British Ornithologists' Union, forty new members were elected—quite an easy record in numbers. A permanent committee was also formed to consider records of occurrences of rare and hitherto unknown bird visitors to Great Britain, and also to confer with the North American Ornithologists, Australian Ornithologists' Union, and others to arrange an international list of Birds. Both are very desirable objects.

Derbyshire seems to be in the limelight just now. We learn from *The Times* that in a report delivered on March 4th, to the South Darley District Council, near Matlock, Dr. Fletcher, the Medical Officer, states that he has discovered that the shale beds at Darley Bridge are oil-bearing, and that water standing in the disused wells of the locality frequently contains oily matter in suspension. Dr. Fletcher goes on to report that the limestone of the district is also rich in metalliferous veins.

* *Mungos* is another name of this genus, see *Proc. Zool. Soc.*, 1882, page 63. The common Indian species which attacks Cobras being the *Herpestes griseus*.

MARINE BANDS, WITH SPECIAL REFERENCE TO THOSE IN THE MILLSTONE GRITS.

W. S. BISAT.

THE term ' marine band,' in the Carboniferous rocks is applied to thin intercalations or ' bands ' of marine strata which occur at intervals in the non-marine rocks of the Millstone Grits and Coal Measures.

That such thin intercalations occurred (and also that these contained a fairly large fauna) has long been known. There are probably many such bands, and they are most interesting and valuable stratigraphically from several aspects, such as their marked lithological character, narrow vertical range, relatively wide area of occurrence and more or less distinctive fauna. All these features render them of far more value to the stratigraphist than had up to recent years been recognized.

They occur as narrow bands, usually of clay shale, generally less than ten feet thick, and sometimes containing nodules or even beds of usually (though not invariably) earthy limestones low down in the marine strata. The clay shales become gradually sandier upwards, passing imperceptibly into the normal sandy shale type.

The outcrops of these marine bands may frequently be recognized a long way off by their occurrence at the foot of an escarpment overlooking a long dip slope. The clay shales of a marine band are often the Achilles heel of the more resistant beds overlying them, and the forces of erosion quickly acting on such soft material cause the escarpment rapidly to recede.

Examples of a marine band causing this recession of escarpments may be seen in almost any Millstone Grit country. Cold Edge, near Halifax, is a striking one. Here the shales under the Rough Rock form the western foot of Cold Edge, resting on a long dipslope formed by the gannisters and grits of Rock A of the Survey.

Another and similar example is afforded by the outlier of Cayton Gill beds capping the divide between the Nidd and the Burn Valley, southwards from Great Haw. Here the cap is largely of the harder ' shell-beds,' and the softer clay shales underlying these have caused this escarpment to retreat a long way back from the main valley edge of the Nidd. (The Cayton Gill shellbeds I regard as a marine invasion of different type from the thin bands.)

In numerous minor escarpments formed by the headwaters of How Stean Beck and Blayshaw Gill in Nidderdale, the Colsterdale Marine Band may be seen at the foot of the

1920 May 1

slope, and the streams (stopped cutting vertically by the K. Grit) may be seen at work cutting laterally into the soft clay shales, and continually exposing fresh faces.

A sandstone or grit rock, with the surface often uneven and waterworn, more often than not forms the floor of a marine band, and frequently there is a thin seam of coal with or without associated grits or ganisteroid sandstones between the marine band and the sandstone floor.

The association of coal seams and marine bands (which of course is a feature in the Coal Measures themselves) is too intimate and of too frequent occurrence to be accidental, and the fact that the coal seam underlies (that is, forms the floor of) the marine band, is a point of paramount importance.

Briefly, these beds—coal seams and marine bands—are the result of slight oscillations (upward and downward) in the gradual downward trend of a slowly subsiding area.

This may seem to be begging the question at issue, but there is an exactly parallel and much later illustration of the same phenomenon in the Humber estuary, which seems to put the issue beyond doubt.

In the Alexandra Dock excavations, and elsewhere in the neighbourhood of Hull, in fact wherever suitable excavations have been carried out, a peat bed has been found several feet below L.W.O.S.T. Immediately resting on this peat bed, or with a very thin layer of flood marls in between, there occurs a marine shell bed.

I regard these two—the peat and the shellbed in close juxtaposition, with the peat below the shellbed—as precisely analogous to the coal seams with associated marine roofs of the Millstone Grits and Coal Measures.

The excavations for the Alexandra Docks above mentioned were admirably described at the time by Mr. Crofts (Proc. Yorks. Geol. Soc., 1901, pp. 245 *et seq.*), and I have been much struck by the notable resemblance between Mr. Crofts' illustrations of the sections seen, and similar features in the Millstone Grits. The right hand illustration on the plate facing p. 248 (No. 6) is noteworthy, and the left hand illustration (No. 5) on the same page with its current erosion and evident non-sequence between the peat bed '5' and the shellbeds '3' and '4' is also paralleled by Carboniferous exposures. See also illustrations No. 4 (where the shellbed is missing), No. 8 (where the peat bed is absent) conditions which are easily paralleled in the Millstone Grit. Nos. 10 and 11 are very like exposures of marine bands and associated coal seams in the Millstone Grit series.

It is not difficult to imagine the sudden crash downwards 'when the cherries were ripening on the trees' (Crofts' *op. cit.*, p. 252), and carrying one's mind back over the immense

gap in time between then and the Millstone Grit period, imagine similar plunges occurring at intervals in those dimly seen estuaries or deltas.

The Geological Survey were evidently aware of this close connexion between coal seams and marine bands, as they say (*Mem. Yorks. Coalfield*, p. 25). ' In many cases these marine bands form the roof of a coal, and this rather looks as if in these cases the land went down with a small jump, when subsidence re-commenced after the stationary period during which the growth of coal went on.' And again, Dakyns (Proc. Yorks. Geol. Soc., Vol. XII. (1892), pp. 133 etc., ' Geology of County between Grassington and Wensleydale), says ' It is remarkable how often limestones (generally thin) are connected with coals or seat earths.'

The fact that a downward oscillation succeeds so abruptly the state of rest (or upward oscillation followed by state of rest) which produced the coal seam is most interesting to the student of the tectonics of an area in which deposition and depression were proceeding more or less *pari passu*, and no doubt interacting on one another.

Depression probably occurred more or less spasmodically, and seems to have been profoundly influenced by deposition (=loading) or vice-versa.

Commencing with the sharp sag down (or ' crash ') forming a marine band, depression seems to have been pushed to its fullest extent by the subsequent sedimentary load immediately brought in ; and it seems likely that there frequently occurred a slight rebound on the cessation from loading caused by the sandbanks or mudflats arriving at summit level (=wave level).

At any rate, pauses in subsidence occurred, accompanied by the growth of vegetation over fairly large areas, and its subsequent preservation in odd places as thin coalseams. The frequent washouts and coverings of ganisteroid sandstone suggest that the rebound assumed above was a fairly tangible feature of this deltaic deposit, leading to the formation of low sandbank hills. On these hills no doubt vegetation flourished, limited only by the extent to which the Carboniferous flora was dependent on a copious supply of water, but all traces of it on the summit were washed away by wave action in the succeeding ' crash,' the coalseams being only preserved in such depressions as were immediately and quickly thrown below wave action as the result of this sharp downward plunge.

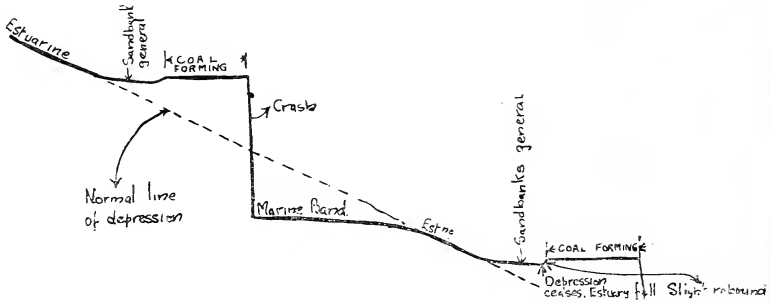
I assume then that these mountain coal seams occupy the site of flats at or near the edges of large sandbank islands studding the deltaic waters during a period of rest from subsidence.

1920 May 1

It is perhaps helpful to indicate by a rough graph the course possibly followed by a point in the delta as it was gradually, though spasmodically, depressed through long ages.

These phenomena form a most interesting illustration on a large scale of the reluctance to move from a state of rest which has been termed 'sticktion.' It is a well-known fact that to start, say a railway train, from a state of rest requires the application of a much larger force than is required to keep it in motion, and this is apparently true also in tectonics, but the forces of Nature are uncontrollable, and produce catastrophic results at times.

If we conceive of a deltaic area forming a portion of a larger area of the earth's crust undergoing subsidence, it seems obvious that the addition of sedimentary loads will cause greater subsidence over the delta on which they are



spread. On the deposits reaching the surface of the water there is a tendency for the subsidence entirely to cease, as the area is already depressed more in proportion than the non-deltaic areas, and the cause, additional load, ceases to operate.

This results in a state of rest over the delta, and to re-convert this into movement requires the application of a very large force. This force is gradually applied by the subsidence of the surrounding non-deltaic areas to such an extent that the delta is now higher than its surroundings and inclined to form an arch, or rather dome. The delta eventually cannot resist the stressing force and collapses, with the results already outlined.

With regard to reactions. Small reactions against loading have been postulated above, mainly to account for the apparent existence of low sandbank hills in portions of the Millstone Grit deltas during certain periods. There are, however, much greater reactions occurring after long time intervals, such as the Permo-Carboniferous Pendle anticline, which forms a reaction on a large scale against the tremendous load inflicted on the district in Carboniferous times.

The reaction or rebound here seems to have been quite in proportion to the original excess subsidence, and resulted in Carboniferous Limestone being exposed by erosion before Permian time.

A study of these reactions would probably prove a fruitful line of research, and the possibility of the Pennine range itself being to some extent a reaction against Carboniferous loading should not be overlooked.

Marine bands may of course (and probably usually do) change in phase laterally, so that the beds in an area *A* differ markedly in facies from the equivalent beds in an area *B*. So little is known yet of the lateral extensions of the various marine bands met with in the Grits that only in one instance—the Colsterdale Marine Band—are we able to trace the change. This band, however, gives most interesting results.

Over practically the whole of the watershed between the Upper Nidd and the Wharfe, this horizon remains extraordinarily uniform in character, it being extremely astonishing in a variable sequence like the grits to see the same few feet of clayshale with the same thin band of black limestone in its lower third occurring time after time in exposures several miles apart. From a stream section on the flanks of Great Whernside to a quarry at Gowthwaite Reservoir (a distance in a straight line of 9 miles) this horizon may be traced with the beds practically unaltered in thickness and nature. To the north, however, there is an abrupt change. Beds of siliceous sandstone and grit occur, apparently as wedges in the clay shales, the limestone bed loses its characteristic black and planar (from whence the name 'The Tesselated Limestone') appearance, and becomes highly encrinital; and a coal seam appears at the base of the marine band. Faunally, *Lingula mytiloides* appears, the lamellibranch fauna becomes far more luxuriant in species and individuals, and gasteropods come in.

Here, then, may be traced, and with reasonable accuracy, a change from comparatively deep to shallow water, with its attendant inferences :—

(1) Prior to the formation of the marine band, dry land with vegetation to the north, and probably wave-washed sandbanks to the south.

(2) On the formation of the marine band :—
   (*a*) Limestone of Yoredale phase in the north and Pendleside phase in the south.
   (*b*) Sandstones, grits and shales in the north and clayshales only in the south.
   (*c*) Rich sub-littoral fauna in the north (including *Lingula*) and relatively meagre fauna in the south.

1920 May 1

FIELD NOTES.

ENTOMOLOGY.

Macroglossa stellatarum.—On March 24th, 1920, a lovely Spring day—I saw a specimen enjoying the nectar of the blooms of *Saxifraga fragrans* in the garden here—rather an early date—but the species was unmistakable. I wish it had been '*Bombyliformis*' which that Sheffield worthy 'grinder' entomologist, 'James Batty,' used to get in 'Sherwood Forest'—not many miles from here !—ALBERT ERNEST HALL, Cranfield House, Southwell, Notts.

COLEOPTERA.

Unusual Habitat of Glow-worm Larvæ.—On a visit to Weedley Springs, near South Cave, on April 6th, I noticed the dried remains of the carcase of a young sheep which had come to an untimely end probably about a year ago. While examining the remnants of the fleece I was somewhat surprised to find a Silphid-like larva of the Glow-worm (*Lampyris noctiluca*) walking about among the greasy wool. Closer search revealed the presence of five further examples, all of them quite active, and from 15 to 17 mm. long. It is difficult to say whether their occurrence on the wool was merely coincidental, whether they had some peculiar liking for the odour of high mutton, or whether they had used the shelter of the fleece as a hibernaculum. As a rule, however, the larva of *Lampyris* spends the winter buried a few inches deep in the soil, emerging at the beginning of April. I am attempting to rear them on snails, their normal food, and find that in the temporary absence of specimens of *Helix* they are taking kindly to freshwater snails of the genus *Limnea*. These larvæ are interesting if only on account of their tiny but bright rear-light, which they display readily on being irritated. On a further visit to Weedley, on April 18th, Mr. H. M. Foster and I found thirteen more examples on the same fleece.—T. STAINFORTH, Hull.

CONCHOLOGY.

Pisidium hibernicum Westerlund in Denmark.—During my residence at Naestved, South Zealand, I often examined the neighbourhood for Mollusca, and the River Susaa which there passes the town received my special attention. A great number of species was obtained which have been kindly re-examined and identified by Messrs. Oldham, Phillips and Stelfox. Among them was *Pisidium hibernicum* Westerlund, of which I found a few specimens in the Susaa.* The first ex-Britannic records were made by

* Schlesch Collection, Hull Museum.

Dr. Nils Odhner from the Lake Tåkern, Östergötland, Sweden, the second record was from Tonset, in Norway, the specimen now being in my collection at the Hull Museum (*The Irish Naturalist*, 1918, page 48), and originally sent me as *P. globulare* Clessin from the Zoological Museum in Christiania. Later it was identified by Mr. Oldham from five places in France and from Ronneby, in Sweden (in Andrews' Coll., Detroit). *P. hibernicum* has probably a wide range.—HANS SCHLESCH, Seydisfjördur.

Arion circumscriptus Johnston, new to Iceland.—Among the slugs I collected during last summer, Messrs. Oldham, Phillips and Stelfox have identified specimens, collected at the rocks of Seydisfjördur, as belonging to *Arion circumscriptus* Johnston (=*A. bourguignati* Mabille). This is the first record for Iceland. Among other slugs found was *Arion subfuscus* Draparnaud, a single specimen, new for the East Coast, and some specimens of *Limax arborum* Bouchard-Chantereaux, belonging to the small mountain form var. *rupicola* Lessona et Pollonera, and a single example of the extreme var. *nigra* of Scharff. All the specimens are included in my collection at the Hull Museum. I am deeply indebted to the above-mentioned gentlemen for their kindness in assisting me in the examination of my finds.—HANS SCHLESCH, Seydisfjördur.

—: o :—

BIRDS.

Abundance of Woodcocks.—Woodcocks have been more abundant here this winter than for many years, and there is every reason to believe that a few will remain to breed. It is a rare breeding species in this part of Airedale, and I have only one record.—E. P. BUTTERFIELD.

Late Nesting of the Ring Dove.—I found the nest of this species, the young of which left the nest on the 21st September. It was built in a pine tree on Blackhills. In some areas of much lower altitude this perhaps may not be a very late date, but this is the latest date I have for this district.—E. P. BUTTERFIELD.

Great Spotted Woodpecker.—This woodpecker was seen many times in this district last year by Mr. S. Longbottom, Bingley, Rosse Butterfield and myself, but its nest was not actually found. I had a fine view of one in October, and in June I watched one in Bingley Wood for some time, and judging by its behaviour I could not be far from its nest. It has been here for the greater part of the last winter if not the whole winter.—E. P. BUTTERFIELD.

Status of the Raven.—Last September Mr. J. W. Carter, of Bradford, told me a young Raven had been picked up, I think he said at Gordale Scar, by one of the members of the Bradford Naturalists' Society. Mr. Arthur H. Norway, in his 'Highways and Byways in Yorkshire,' page 342, in his description of Gordale, records the Raven as having flapped heavily across the gorge, croaking harshly on his visit, presumably about the year 1903, this being the year of publication of his book. On a visit to Grass Woods, Grassington, last September, having left Mr. J. W. Carter near the highway which separates the upper from lower Grass Wood, I went in the direction of Dibb Scar, at which place I had a distinct view of a Raven which passed me within a few feet, as I was well concealed at the time. A fear was entertained some years ago that this species was on the verge of extinction in some of its old haunts in Britain, but of late years it is gratifying to think that it is on the increase in some districts, especially in Scotland.—E. P. BUTTERFIELD.

The Raven has almost ceased to breed in Yorkshire, the combined efforts of the egg collector and gamekeeper being responsible for this. Every year I hear of one or two attempts at nesting, but if the birds escape the attention of the gamekeeper the nests are certain to be raided by egg collectors. In the Lake District they are still fairly plentiful despite continued persecution by both the above individuals; the fact of the birds being under special protection, being no deterrent to 'human' activities.—R.F.

'Cock-nests' of the Common Wren.—Much speculation has been indulged in regarding the use of these nests. One or even more of these nests can sometimes be found in the vicinity of the nests of this species which have been built for breeding purposes, the former nests being much more primitive and frail, and frequently completely made of dried fronds of ferns or mosses, without any lining such as feathers, etc., which are usually found in the latter. It is usually thought that 'cock-nests' are built by the cock bird and are used exclusively for roosting or sleeping purposes. I have, however, found that sometimes a 'cock-nest' may be built as early as March and remain in this condition until approaching May, after which it may be utilised for breeding purposes, and in rare instances I have known fledged young leave the nest in which they have been reared and take possession of a 'cock-nest' and use it for sleeping purposes, at least for some little time; and sometimes a 'cock-nest' may on an emergency, such as the robbing, etc., of the eggs from the nest which has been built for breeding purposes before the female has laid her full clutch, be utilised for laying the complete clutch. On the 19th May I was taken

to the nest of a Wren which contained two eggs, but the nest was robbed shortly afterwards. On visiting the 'cock-nest' a few days later it contained three eggs. A boy told me of a still more striking case; he, along with one or two boys had caught a Wren on the nest with eggs and, boy-like, they took the nest and eggs to a hen cote near by after clipping the wings of the hen bird, by which method they thought the old bird would continue to sit on the eggs. However, she escaped from the nest and they found her sometime afterwards sitting upon some eggs in the 'cock-nest.' As regards the vast majority of these 'cock-nests' no use is made of these, other than for sleeping or roosting purposes, or both.—E. P. BUTTERFIELD.

——: o :——

CORRESPONDENCE.

REPTILIA IN UPPER WHARFEDALE, ETC.

With reference to Mr. H. B. Booth's notes in *The Naturalist*, p. 125, I have met with the Slow Worm in this district (Wilsden) but only once and this must be at least fifty years ago, and the Common Lizard is still to be met with within a short distance from here.—E. P. BUTTERFIELD.

——o——

BIRD PHOTOGRAPHY.

IN *The Naturalist* for January Mr. H. B. Booth, in referring to the Heron, says, 'The pair that nested last year (1918) at Bolton Woods did not return this year: probably the nest and its contents were too much photographed.' As I was the only person who attempted to photograph them, I should like to point out that the total time occupied in doing so was from 3-45 a.m. till noon, on Whit Sunday, May 19th. One of the two young was a cripple and subsequently died of starvation, the other being able to fly slightly by that date. I therefore beg to repudiate Mr. Booth's groundless assumption, the more so since the birds *did* return in 1919. That they nested in the same wood I am not prepared to say since I did not hunt up the nest. Every morning in May, exactly as in the previous year, one of the old birds came daily to the Low Dock on Barden Moor to fish, and was seen winging her way to and from the Bolton Woods just as she did in 1918 when she had her nest there. There is no doubt that the birds returned. In the interests of bird photographers I should be glad if you could find room for this letter in your columns.

WM. ROWAN
(*University of Manitoba*).

I think on Mr. Rowan's own showing he has justified my remarks. A pair left their ancestral heronry—where there is a certain 'safety in numbers' nesting together. They took risks in choosing a wood several miles away from any of their companions' nests, and are subjected to an ordeal of 8¼ hours on end, of a man (or men) in close vicinity to the nest and doubtless part of the time in the tree, and close to their young. As well as other members of the Yorkshire Naturalists' Union, I was over the ground several times in 1919, and never saw anything of the Herons or their nest as I had seen in meagre visits in 1918. From several enquiries I made from able ornithologists I was definitely informed that they were not nesting there, and that 'they were a good deal interfered with last year.'—H. B. BOOTH.

BIRDS OF THE EASTBY DISTRICT.

Mr. Rowan, in *The Naturalist* for March and April, states that the Jay was formerly abundant, particularly at Barden. It certainly has not been abundant for the last forty years. Is Mr. Rowan quite sure he is right when he states that the Grey Wagtail is non resident and that the Garden Warbler is but thinly distributed? He further says the Chiff-Chaff is practically unknown as a breeding species, but I have heard this species once in full song, near Barden Tower, in the height of the breeding season, but did not find its nest. The Stonechat mentioned as having been seen by Birch on Barden Moor was perhaps on migration. I have been well acquainted with this locality for over forty years, but have never found the Stonechat breeding in the area covered by Mr. Rowan's observation, but have frequently seen the Whinchat, especially about the lower Barden reservoir. Common as the Spotted Flycatcher is, can it be said that it is the most abundant of the summer migrants, and it is quite accurate to say that this species arrives at its breeding quarters earlier than the Pied Flycatcher? Of course I mean in average years. Mr. Rowan heard the tapping of either the Great Spotted or Lesser Spotted Woodpeckers but was uncertain as to which species. I have seen the Great Spotted Woodpecker in the district. In average years I think the Swift will arrive at Barden Tower a little earlier than the 14th May. He mentions that the Hawfinch nests annually near Bolton Abbey. It was in this locality that I first became acquainted with the nesting habits of this species and it was on Barden Moor where I first heard the Grasshopper Warbler.—E. P. Butterfield.

—o—

PUGNACIOUS SKYLARKS.

On April 7th, 1920, there occurred, after some excitability on the previous days, three combats which seemed clearly to be connected with mating. About 11 a.m., three birds fought in the air, being so mixed up that it was difficult at first to distinguish the opponents. But after a while, one, undoubtedly a female, descended to the ground and began to feed, leaving the other two, which were pecking furiously at each other, to decide the combat themselves—it being apparently *quite unconcerned* as to which of these two should be its mate for the nesting, judging from the fact that it took *no notice* of the combatants. After a severe tussle, lasting about four minutes, one male retired soaring out of sight.

The victorious male then sat for several minutes on top of an upright post, and kept on bobbing-down its head and raising its tail at the same time, clearly a courting display to the female on the ground.

Later on, a second combat started in which these two and also seven others were engaged; but they dodged about so much that it was impossible to follow the course of the squabble and say which were males and which females among them. This lasted about ten minutes, after which two, which seemed to be those in the first combat, returned to the post and ground respectively.

Later on, a single bird appeared which seemed undoubtedly a male (possibly the conquered one from the first combat); and it and the male which was sitting on the post engaged each other furiously, pecking *very vigorously*, the combat ending rather suddenly in the retreat of one of them.

Judging by the fact that the female, which had remained all this third combat sitting on the ground, then rose and flew off with the victor, it seemed to me that this was a *different* bird from the victor in the first combat.

The above combats (especially the first and third) were far more furiously and stubbornly contested than what I have seen in former years—possibly due to scarcity of females in proportion to males.—

Frederick D. Welch.

THE JAY IN UPPER WHARFEDALE.

I should like to ask Mr. Rowan what evidence he has for stating that the Jay was 'formerly *abundant*, particularly at Barden ?' This is contrary to what I have ascertained. I certainly have found one Jay's nest (and that was not far from Barden Tower) but it is more than thirty years ago. It was considered a rarity then, and that caused me to enquire more into its local status. I was informed on what I considered to be good and reliable local authority that during the 'eighties of last century several pairs of Jays were liberated in Bolton Woods. For a year or two after Jays were more often seen or heard ; but they gradually died off or left this district. For the past twenty-five years I can testify to the Jay being only an uncommon and erratic winter or autumn visitor. I attribute its scarcity to some other cause than to the enmity of gamekeepers—or magpies would not be so abundant. There is something in the district that is not suitable or agreeablle to its habits. In Norfolk, where gamekeepers are far more numerous than they are here, the reverse occurs. The Jay flourishes there, whilst the Magpie is uncommon and very local.—H. B. Booth, Ben Rhydding.

—o—

IS THE GREY WAGTAIL DOUBLE-BROODED ?

Mr. Rowan treats the nesting of our three common Wagtails as the same. He gives them as 'two broods the rule,' or 'second broods the rule.' In a much wider area than is included by Mr. Rowan's notes I have always considered the Grey Wagtail to be single-brooded. If undisturbed the young Grey Wagtails leave their nests during the second half of May, after which for many weeks they can be seen in family parties with their parents, as they slowly work down to the larger streams or rivers. The Pied Wagtail, on the other hand, is usually double-brooded, if unmolested, and on occasions I have known the young still in the nest in August—though probably some interference or accident had happened at some stage of their housekeeping arrangements. With the Yellow Wagtail, I am a little uncertain, although I believe it is usually single-brooded ; but being more of a flat-ground nester than the other species its nest is much more liable to accident and to molestation. It is also much more difficult to say whether a late nest is a second brood, or repeated attempts to bring off a brood. The instance recorded by Mr. A. Haigh Lumby of a pair building and laying in August is a case in point. I must congratulate Mr. Rowan on recording the nesting of the White Wagtail in this district. I have repeatedly stated that I am certain that it occasionally did (see *The Naturalist*, 1916, pp. 354-355, etc.) but I have never happened to have the leisure to follow up a 'suspect' and actually to prove its nesting in this district. I am pleased to be able to make use of this opportunity of pointing out that in my notes of the nesting of the White Wagtail in Yorkshire (*The Naturalist*, 1916, pp. 354-5) I overlooked two reports of its nesting. One pair was reported to have nested on Brierley Common in 'The Birds of Wakefield, 1876,' and another pair is reported to have nested in a quarry near Sedbergh. Both are reported in Nelson's *Birds of Yorkshire*, pp. 123-4. —H. B. Booth, Ben Rhydding.

—o—

MAGPIES, ETC. : USEFUL OR HARMFUL?

I have lately read in your issue of July, 1916, an article by Mr. W. A. Durnford, entitled, 'Decreases in Yorkshire Birds.' It criticises Mr. Riley Fortune's remarks on this subject, in his Presidential Address for that year, also reproduced in your columns, and contains the following sentence :—'No one will deny that, by the destruction of the Sparrow-

hawk and the Magpie and, above all, of the domestic cat . . . the game-keeper has proved himself the best friend of the vast majority of our British Birds.'

Will you allow me to disprove the truth of this statement by making the requisite denial myself. I lived for three years in Brittany, where Magpies, Crows, and Jays abounded, adding enormously—especially the former—to the general beauty and interest of the countryside. Side by side with them—and also with Hawks in their degree and cats too—every kind of small or medium-sized bird which we have, or ought to have, here, abounded also. Warblers were especially numerous, so were Buntings—more especially Cirl Buntings—Pipits, Meadow and Tree—Woodpeckers—Turtle Doves, so—or at least well represented—were Golden Orioles. As a bird-watcher I found myself in paradise, comparatively, and I could go everywhere. I satisfied myself that the Magpies did some amount of good and no harm in the country, and an English gentleman who had settled, as a farmer, near me, told me that the French Government had satisfied themselves of this, too, insomuch that they rescinded an edict for thinning their numbers, through evidence taken on the spot. If I remember, he contributed to this evidence. I have watched them, day after day, busily occupied in feeding over pasture and arable land, just as do Peewits, and I have again and again seen the Jays, in the numerous fruit-trees, obviously searching for insects. There were so many of both of them, as also of the Crow, and I was so much in the open, that had they really spent much of their time in robbing the nests of small birds, I must, I think, have seen something of it. But I did not—it was wonderfully hidden. In Brittany I saw what it was when birds were all let to live together, when there were no disturbing game laws and no destroying keepers on account of the war. I saw what the balance of nature, when uninterfered with by slaughter-loving men, really meant, and the detestable folly and philistinism of interfering between one wild species and another was brought fully before me.—Edmund Selous, April 17th, 1920.

——: o :——

The death is announced of W. A. E. Ussher, formerly of H.M. Geological Survey.

Sir Ronald Ross writes a trenchant article on ' A Great Default,' in *Science Propress* for April.

The new cover to *The Geological Magazine* enables the Editorial paragraphs to be read without opening the magazine. In future, the abstracts of papers read to the premier geological society of the world are to be omitted, but a request is made for reports of meetings of smaller geological societies, and even for abstracts of papers read to other than purely geological societies. Doubtless the Geological Society of London takes this as a compliment, if a veiled one.

We received, together, *The New Phytologist* ' Double Number, Vol. XVIII., Nos. 9 and 10, Nov. and Dec., 1919. [Published, March 29th, 1920].' and of the same journal, ' Double Number, Vol. XIX., Nos. 1 and 2, Jan. and Feb., 1920 [published, March 30th, 1920],' Why this extraordinary system of ' double numbers ' (unless it is to obtain 5s. instead of 2s. 6d. a part) it is difficult to say, especially as one part contains only 36 pages and the other 48. Surely it is to be expected that some of the articles will be quoted, and ' Vol. XVIII., No. 9, Nov., 1919, [Mar., 1920],' would be quite long enough. The first part contains two papers, *Festuca rubra* near Cardiff, by W. D. Howarth, and ' A Phaenological Study,' by Sir Francis Darwin. The second contains The Evolution of Plants, Notes on Equisetum, Mutations and Evolution, *Campylonema lahorense*, Actinomyces-like Endotrophic Mycorhiza, and Elementary Lecturing.

Naturalist,

NORTHERN NEWS.

Mr. L. J. Wills has a paper on 'The Geology of the Llangollen District' in the *Proceedings of the Geologists' Association*, Vol. XXXI., Part 1.

Dr. F. A. Bather will preside over the Geological Section, and Prof. J. Stanley Gardiner over the Zoological Section, at the Cardiff meeting of the British Association.

The South-west Yorkshire Entomological Society has issued a syllabus of its excursions and meetings, with a list of members, etc. The president this year is Mr. B. Morley, and the Secretary Mr. J. Hooper.

Referring to Mr. H. B. Booth's query on page 125, the Rev. E. A. Woodruffe-Peacock points out that the 'blind worm,' is so called because when killed the eyes close, whereas in snakes they never do.

The Transactions of the Yorkshire Dialect Society (Part XXI., Vol. III.) contains a paper by F. J. Taylor, entitled 'The Bibliography of Yorkshire Dialect Literature,' and other items of interest to students of Yorkshire Dialect.

Vol. III., Part 4, of *The Proceedings of the Cheltenham Natural Science Society* (22 pp., 1s.) covers the period 1917-1919. It includes the Presidential Addresses of C. I. Gardiner, on 'Nitrogen—the Preserver and Destroyer of Life,' and of W. T. Boone on 'Calcite. The Structure of Crystals.'

At the small price of 6d. the Ministry of Agriculture and Fisheries has issued *A Report of Proceedings under the Salmon and Freshwater Fisheries Acts, &c.* (sic); 123 pages. The report contains useful information and statistics relating to the Fisheries in various parts of the country.

Vol. XX. of *The Journal of the Northants. Natural History Society and Field Club* contains the four parts published during 1919. Among the papers are River Systems, by B. Thompson; Printers and Booksellers, by R. W. Brown; Invasions of Saxons and Angles, by T. J. George; Meteorology, by C. A. Markham; The George Hotel, Northampton, by A. Adcock. All the papers refer to the county of Northampton.

The Annual Report of the Huddersfield Naturalist, Photographic, and Antiquarian Society (28 pp., 6d.), has been received, and contains useful summaries of the Society's work in different directions by M. C. Whiteley, C. Mosley, L. Neaverson, C. Wood, E. Fisher, J. W. H. Johnson, W. E. L. Wattam and T. W. Woodhead. There is a note on 'The Gravels at Kirklees Park,' by Dr. A. Gilligan, in which the percentages of the different minerals are given.

The Transactions and Proceedings of the Perthshire Society of Natural Science, Vol. VII., Part 1 (36+xxiv. pp.) are to hand. J. Menzies gives a list of the Discomycetes of Perthshire, and also records a rare Myxomycete (*Linbladia effusa*) for the first time in the county; A. M. Scott writes on 'The Caledonian Camp, the Haer Cairns, and the Steed Stalls, in the Stormont,' and there is a presidential address by G. F. Bates, on 'The Nitrogen Problem,' and another presidential address on 'Diatoms,' together with a report of the Society's work in recent years. The Perthshire Society still keeps up the local character of its publication.

At a recent meeting of the Lancashire and Cheshire Entomological Society, Mr. Wm. Mansbridge recorded five species new to the Lancashire and Cheshire List, viz., *Nonagria geminipuncta* Hatchmere; *Depressaria cnicella*, bred from sallow, Formby; *Retinia purdeyii*, Burnley; *Lithocolletis sorbi* Delamere, Eastham and Woolton; *Elachista magnificella* Sales Wood, near Prescot; *Crambus uliginosellus*, new to Lancs., from Holker Moss. It was noted that melanism in *Phigalia pedaria* and *Hybernia leucophearia* seemed to be more marked at Eastham and Delamere than usual. Mr. W. Mansbridge brought some curious shortwinged specimens of *Coenonympha pamphilus* and *Selinia bilunaria* from the Grange district and Torquay respectively.

NEWS FROM THE MAGAZINES, etc.

A note on ' Neuroptera and Trichoptera new to Cumberland,' appears in *The Entomologist's Monthly Magazine* for April.

' Results of Ringing Birds,' by H. F. Witherby, and ' Status of Goldfinch in Yorkshire,' by R. Fortune, appear in *British Birds* for April.

Mr. E. P. Butterfield compares the status of the Common Wren in Ireland with that of north-west Yorkshire, in *The Irish Naturalist* for March.

An interesting article on ' The State and the National Museums ' appears in *Nature* for March 11th, 1920, and is discussed in subsequent issues.

' Geology and the War,' is the title of a paper by P. G. H. Boswell in *The Quarry*, for April. It was originally read to Section B (Chemistry) of the British Association last year, when the title was ' Geochemistry and the War.'

We have received *Camping* for March. It is the official organ of the Camping Club, and contains much practical and other information likely to interest those who like outdoor life. There are reproductions of interesting photographs, etc.

Mr. H. B. Booth is the president of the Bradford Natural History Society, and Mr. H. J. M. Maltby the secretary, in place of Mr. F. Jowett who had served in that capacity for several years, and received a testimonial on his retirement.

' *Limnaea stagnalis* devoured by rats,' is the title of a note in *The Lancashire and Cheshire Naturalist* for April. The same journal records a ' celt of Carboniferous limestone ' which seems unusual. We should hazard either that it was not a celt or was not Carboniferous limestone.

Among the contents of *The Entomologist*, for April, we notice ' Collecting Fungus-gnats,' by Claude Morley. There is a note on the erratic appearance of Spring Geometers at Windermere, and the relative proportions of females and males of ' Winter Moths,' and of *Phigalia pedaria*.

The Geographical Teacher for ' Spring, 1920,' contains the presidential address by Sir Charles P. Lucas, on ' Islands, Peninsulas and Empires ' ; Rainfall considered as a Geographic Function ; The Ordnance Survey and Map Issues ; Regional Factors in Agriculture, by E. J. Russell ; and several shorter geographical items.

Among the contents of the *Annotationes Zoologicae Japonensis*, Vol. IX., pt. 5, we notice *Coeloplana bocki* n. sp., and its development ; *Gastrodes parasiticum* and its systematic position ; Two new Japanese Polyclads, Japanese and Formosan Mammals, Japanese *Retepora* and *Adeonella*, and *Mallophaga* from Formosan birds.

We see from the press that Mr. B. T. Harland, legatee under the will of the late Thos. Boynton, F.S.A., has offered certain specimens of local interest from the Boynton Collection to the Bridlington Corporation, on condition that the Corporation provide a suitable room and caretaker. The Bridlington Corporation seems to be agreeable to accept the specimens without accepting the conditions.

For some reason or other all sorts of addressed envelopes, etc,, seem to reach us. A post-card, a little while ago, addressed ' Mr. Shepherd, *Food Dept.*, Hull,' was handed in, presumably because it dealt with the price of bones ; a little later, a post-card, posted in the south of England, and addressed to ' His Satanic Majesty, Hell,' was put into our hands—presumably because it referred to coal, and Hull was as near Hell as the post office was able to deliver. And, from America, a letter addressed to ' Editor, *On the Road*, Hull, British Isles,' has just been put into our letter box.

Naturalist

Twelve Illustrations, beautifully printed in colours and Mounted on Stout Boards, 24 × 19 inches, eyeletted and strung, including Descriptive Handbook, in Leather Board Case 17/6 net the set.

BROWNS'
ENEMIES OF THE GARDEN

Reproduced in the very best style of Lithography from special designs by
H. W. BRUTZER, M.A., F.E.S.

THE 12 ILLUSTRATIONS ARE AS FOLLOWS :

1. OUTLINE OF INSECT LIFE.—Hymenoptera, Coleoptera, Lepidoptera, details.
2. LACKEY MOTH.—Egg, Caterpillar, Nest, Cocoons, Female Lackey Moth, Egg Cluster.
3. SMALL ERMINE MOTH.—Eggs, Caterpillar, Cocoons, Ermine Moth, Nest in Apple Tree.
4. GOOSEBERRY SAWFLY.—Egg, Larva, Larva (last stage), Leaf, Sawfly, Branch, Cocoon.
5. ASPARAGUS BEETLE.—Eggs, Larva, Beetle, Pupa, Asparagus stripped of leaves, Cocoon.
6. BLACK CURRANT MITE.—Mite, Big Bud on Branch, Section of Bud with Mites.
7. RASPBERRY STEM BUD CATERPILLAR.—Caterpillar, Chrysalis, Moth (enlarged), Raspberry Cane.
8. MILLIPEDES and CENTIPEDES.—Three destructive Millipedes and two useful Centipedes.
9. SCALE.—Currant Scale, Scale on Aralia and Myrtle Leaves and Mussel Scale.
10. WIREWORMS.—Click Beetle and Skip Jack showing details.
11. PEA THRIPS, COCKCHAFER, DADDY LONGLEGS, WOOD-LOUSE and EARWIG, showing sections and details.
12. SOME USEFUL INSECTS.—Dragon Fly, Ichneumon Fly, Lady Bird, Tiger Beetle, Hover Fly, Glow Worm, Cocktail Beetle, Lacewing Fly.

All the designs are printed on appropriately tinted backgrounds, devoid of any white border, thus enabling the various sections on the Charts to be seen with great clearness.

We always have enemies within our garden-gates, and would-be gardeners are often reminded that the results of their labours may be brought to nought or greatly lessened by the work of destructive insects. There are other insects, however, that are our Allies, as they live on the destructive pests and thus help to protect the vegetables and fruit. It is, therefore, most necessary to be able to distinguish between useful and destructive insects, hence the popularity of Browns' "Enemies of the Garden," as the charts show at a glance how to tell our enemies from our friends. A set of the illustrations should be exhibited in all our schools or village clubs, as the knowledge which they and their accompanying handbook convey is essential to successful gardening. The small expenditure on same will prove a truly profitable investment.

LONDON : A. BROWN & SONS, LTD., 5 Farringdon Avenue, E.C. 4.
AND AT HULL & YORK.

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
May 1st, 1920.

JUNE 1920. No. 761
(No. 535 of current Series)

THE NATURALIST.

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

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.
The Museums, Hull;
AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, D.Sc., F.R.S., F.L.S. **G. T. PORRITT, F.L.S., F.E.S.**
Prof. P. F. KENDALL, M.Sc., F.G.S. **JOHN W. TAYLOR, M.Sc.**
RILEY FORTUNE, F.Z.S.

Contents :—

LONDON:
A. BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.
Printers and Publishers to the Y.N.U.

Price 9d. net. Prepaid Subscription 8/6 per annum.

BOOKS WANTED.

Alford Nat. Hist. Soc. Reports. Set.
Barrow Nat. Field Club Trans. Vol. VII.
Bath Field Nat. and Arch. Soc. Vols. VIII.-XI.
Bedfordshire Natural History Society Proceedings. Set.
Birmingham Nat. Hist. and Phil. Soc. Proc. Vol. I., part 2.
Brighton and Sussex Natural History Society Reports, 1870, 1872-3.
Burnley Lit. and Sci. Soc. Parts 8, 12, 13, 16-27, 29-
Chester Soc. Nat. Science: Ann. Reports, i.-iv.
Cleveland Lit. & Phil. Soc. Trans. Science Section or others.
Croydon Nat. Soc. 6th Report.
Dudley and Midland Geol. etc., Soc. Vols. II.-IV.
Discovery. (Liverpool, 4to). 1891.
Derby Arch. and Nat. Hist. Soc. Part 21.
Devonshire Assoc. Adv. Science. Vols. I., II., III., XXXV., 47-
Dublin Geol. Soc. Vol. I., pt. 1, 1830?; Vol. VII., parts 1-3 (or complete Vols.). 1855.
Eastbourne Naturalist (1 part).
Eastbourne Nat. Hist. Soc. Vols. II.-III. (or parts), and part 6 of new series.
Edinburgh Geol. Soc. Vol. III., part 3; Vol. IV., part 1.
Frizinghall Naturalist. (Lithographed). Vol. I., and part 1 of Vol. II.
Garner. No. 60.
Geol. and Nat. Hist. Repository, Mackie's. Vols. II., III.
Geol. Assoc. Proc. Vol. I., Part 1.
Geol. Soc., London, Trans. 4to. 2nd series, Vol. VI., and Pts. 1-3 Vol. VII. (or Vol.).
Geol. Soc. Quarterly Journal. Parts 5 and 7.
Geological Magazine, 1890-1-2-4.
Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).
Illustrated Scientific News. 1902-4. (Set).
Journ. Micrology and Nat. Hist. Mirror. 1914—
Keighley Naturalists' Society Journal. 4to. Part 1.
Kendal Entomological Soc. 3rd Report.
Lancs. and Cheshire Antiq. Soc. Vols. IV., V., VIII., XXVI.
Louth Ant. and Nat. Soc. Reports, 1-12, 19.
Liverpool Marine Biological Com. 1st Report.
Liverpool Geol. Association Proc. Parts 1, 3, 16.
Liverpool Nat. Journ. Parts 1, 3, and 20.
Manchester Geol. Soc. Trans. Vols. XV., XVI., XIX.-XXIII.
Marine Biological Assoc. Journal. Vol. I., Pts. 2 and 3.
Naturalists' Guide (Huddersfield). Parts 1-38.
Naturalists' Record. Set.
Newbury District Field Club Transactions. Vols. III. and on.
North Staffordshire Field Club Reports for 1869, 1871-2, 1876.
Peterborough Natural History Society. Reports 1-8, 11-12, 14-25.
Quarterly Journal of Science. 1878-9, 1882-3, and 1885.
Quekett Club Journ. 1st Series, No. 25.
Royal Cornwall Geological Society Trans. Vol. V. to date.
Salisbury Field Club. Transactions, Vol. II.
Scottish Naturalist. 1881-1891.
Simpson's Guide to Whitby. 1st ed., 1862.
Smith's New Geological Atlas of England and Wales. 1819-21.
Sussex and Hants. Naturalist. 17 parts.
Sussex Arch. Collections. II.-V.
Tweddell's Bards and Authors of Cleveland. Parts 9-12.
Union Jack Naturalist. Any.
Vale of Derwent Nat. Field Club. Old Series, Vols. I. and III.
Wakefield Lit. and Phil. Soc. Reports. Set.
Woolhope Club Trans. 1871-3, 1877-80.
Yorks. Nat. Club Proc. (York). Set. 1867-70.
Yorks. Nat. Union Trans. Part 1.
Young England. Set.
Zoologist, February, 1905.

Apply—**Editor, The Museum, Hull.**

NOTES AND COMMENTS.

NATURAL ' EOLITHS.'

At a meeting of the Geological Society of London, on May 5th, a communication was read on ' A Natural " Eolith " Factory beneath Thanet Sand,' by Samuel Hazzledine Warren, F.G.S. The paper describes a section in the Bullhead Bed at Grays, where the conditions have been favourable for the chipping of the flints by subsoil pressure. There is evidence of extensive solution of the chalk beneath the Tertiary deposits, and the differential movements thus brought about have occasioned much slickensiding, and remarkable effects in the chipping of the flints. The section affords the most complete and conclusive evidence hitherto obtained in support of the theory of the origin of the supposed Eolithic implements by purely natural agencies. There are not only the simpler Kentish types, such as notches, bowscrapers, and the like, but also the larger and more advanced forms of rostro-carinates which are characteristic of the sub-Crag detritus-bed. Careful digging enables the pressure-points of one stone against another and the resultant chipping effects to be studied in detail ; and in many instances the flakes removed can be recovered and replaced. A few examples are more than merely Eolithic in character. If such exceptional examples were removed from their associates, and also from the evidences of the geological forces to which they have been exposed, no investigator could be blamed for accepting them without question as of Mousterian workmanship. Individual specimens may often deceive : in order to distinguish a geological deposit of chipped flints from the débris of a prehistoric chipping-floor, it is necessary to base one's judgement upon fairly representative groups, and also to take into consideration the circumstances in which they have been discovered.

TERTIARY MAN.

In the discussion, Sir Henry Howorth thought the facts which the author had brought before the Society were important and illuminating. They went far to support the view that the case for the existence of Man in Tertiary times in our latitudes is not attested by satisfactory inductive evidence, but is based on untenable premises. The case for the existence of Tertiary Man is so weak, when brought face to face with both *à priori* and deductive arguments, that the burden of proof should be laid on the champions of the new views. The speaker considered that the case as yet presented rests at the best on a few doubtful and ambiguous facts, and ignores a great mass of most potent evidence on the other side. The author had effectively demonstrated that the so-called ' Eoliths ' were not Eoliths at all, since that name was already appropriated for French stones entirely different from the English examples. Those who hold that

the wrongly-called English ' Eoliths ' were not of human origin or the result of design, base their contention first on the fact that the vast majority of them have no assignable purpose, being, so far as can be seen, of no use to human beings, while the relatively few to which some purpose could perhaps be assigned are either accidental freaks or else aberrant Palæolithic forms. To contend that the biting of the edges of flakes and angular fragments into a series of notches can only be assigned to human initiative, is simply an attempt to carry the position by the use of a negative instead of a positive argument.

ARCHÆOLOGICAL COLLECTIONS.

Sir Martin Conway's address at the Manchester Museum recently, on ' The Archæological Collections of a University Museum,' is printed in *The Museums Journal* for March. In this Sir Martin states, ' I claim that a museum should bear to the intellectual life of a community the relation that illustrations bear to a book. Some book illustrations are frankly decorative, things of beauty existing and introduced for beauty's sake ; others are records ; others again are explanatory of theories and principles. A museum should contain as full an illustration as possible in a material and representative form of all the categories of objects embraced in the widest and best education offered by the community, and of all those subjects in which intelligent members of it may be expected to take interest. A country house containing a good library, some fine works of art, and some collections of objects of interest, is a pleasanter place to stay in than one lacking such stimulants for the imagination and food for the intelligence. It is the same with a city. If a family may be judged by the character of their home and its contents and arrangement, the inhabitants of a city may similarly be judged by their museums.'

BIRD PROTECTION IN YORKSHIRE.

We are asked by the Secretary of the Yorkshire Wild Birds and Eggs Protection Committee to make an urgent appeal for funds to enable the good work this Committee is doing to be carried on. During the war a public appeal was not made, and the Committee's work was quietly carried on by a few Yorkshire naturalists. There was a small balance in hand at the beginning of the year, but this is not sufficient to pay for all the watchers, etc., for the present summer. Those who know what excellent results have accrued from this Committee's labours will wish our friends to ' carry on.' The few pounds required will be well spent in preserving our rarer avi-fauna, and in preventing thieves and robbers from taking the nests of some of our finest birds. Subscriptions should be sent to Mr. Johnson Wilkinson, Vermont, Huddersfield.

BRITISH MOSQUITOES.

The British Museum has produced a magnificent ' Handbook of British Mosquitoes,' by Dr. W. D. Lang,* in which the author gives interesting chapters dealing with Gnats, or Mosquitoes, and other Flies, and their structure. He refers to their life history, nomenclature ; identification, and gives a Systematic Account ; Reputed, Doubtful, and Fossil British Species, and Evolutionary and Concluding Remarks. There are five excellent coloured plates of *Anopheles maculipennis* (Meigen), *A. bifurcatus* (Linnæus), *A. plumbeus* Stephens, *Ochlerotatus caspius* (Pallas), *O. nemorosus* (Meigen), all considerably enlarged, by E. Terzi.

NEW VARIETIES.

The Entomologist's Monthly Magazine for May contains descriptions of ten new varieties of *Abraxas grossulariata,* by G. T. Porritt, but unfortunately no figures accompany the descriptions. The new names are ' vars. *lunulata, aureo-fasciata, raynori, odersfeltia, mixta, vauata, sparsata-varleyata, nigro-varleyata, sparsata-hazeleighensis.*' The same journal records *Polydrusus flavipes* De G. and *Andrena ruficrus* Nyl. in Yorkshire, the latter little-known bee being plentiful at Adel, near Leeds. E. E. Green gives ' Observations on British Coccidæ,' in which he refers to many Yorkshire specimens.

NEWSPAPER NATURAL HISTORY.

Mr. Herbert E. Wroot, who for about seven years before the War conducted the ' Out of Doors ' column in *The Yorkshire Observer,* of Bradford, and made it one of the most useful and educational of popular expositions of natural history, has recently resigned and taken up an appointment on *The Yorkshire Post.* We are pleased to see that his going to Leeds is followed by the appearance of a weekly column, ' A Nature Lover's Diary,' in *The Post* of Thursday mornings. For years our premier newspaper has done less than justice to natual history matters, and has allowed its reports of excursions of the Naturalists' Union and of the Yorkshire Geological Society to be altogether eclipsed by those of its Bradford neighbour. Naturalists in the county will hope that a new regime is beginning. It is a great treat to read reliable nature history, instead of the ' twaddle ' which usually passes as ' nature notes.'

ARCHIVES OF FORESTRY.

We have received No. 2 of ' The Archives of the Cambridge Forestry Association.' The editors decline ' to be bound by or in volumes of any fixed size, more especially as we have no idea whether our funds will last long enough for the

* 125 pages, and plates, £1.

Archives to arrive at the binding stage.' The pamphlet contains many interesting notes, one of which discusses the advisability of making 'trees grow square,' 'so as to do away with waney planks and the difficulty of converting frustra of cones into cubic feet'; although the article seems principlaly to deal with warts! The editors add 'we should much like to carry out a research on these lines, but being a School of Forestry we have neither woods nor trees to experiment upon, nor funds for the purpose, nor men to do the work. We freely give this suggetsion to our more fortunate "sisters-in-forestry."'

FORESTRY STORIES.

Presumably bearing on the Society's work; we extract the following from these Archives—'Gentleman, sometime medical student, ex-service man (private), twice wounded, desires outdoor occupation in Forestry. Willing to start as labourer. Apply Editor (*pro. tem.*), C.F.A. School of Forestry.'

We do not vouch for the following:—

PHYSICS.—(Scene: Professor's private Lab. Enter Lady Demonstrator. Magnetic storm amongst instruments).

Prof.: "Go away!"

L.D.: (Approaches. Instruments jazz furiously): "Please Sir! . . ."

Prof.: GO AWAY!!! Never enter this room with steel corsets on!

SYLVICULTURE.—(Scene: Lecture-room. Discourse upon seedling trees).

Prof.: "To safeguard the nursery against the inroads of mice, a deep trench must be dug around it."

Undergrad.: "How should you get in yourself, Sir?"

Prof.: "Of course, there would be a bridge!"

Undergrad.: "Wouldn't the mice come in over the bridge as well, Sir?"

——: o :——

The Proceedings of the Geologists' Association, Vol. XXXI., part 2, are principally occupied by valuable papers dealing with the Geology of the Cardiff district.

British Birds for May contains some notes by Mr. Witherby, 'On Some Results of Ringing Certain Species of Birds'; and a record of Lapland Buntings in Northumberland.'

A note in *The Entomologist* for May records the fact that *Pararge megaera* was common in the Bradford district of Yorkshire in the late 'sixties of the last century, but has not since been seen.

The Lancashire and Cheshire Naturalist for May has a note on 'The Occurrence of *Asellus meridianus* Rac., in Derbyshire,' by Dr. W. M. Tattersall; and 'The Sensitive Mechanism in Plants,' by Margery Knight; 'A Parasitic Dipteron new to Lancashire,' by W. R. Eastwood; and a note 'On Sexual Differences in the shell of *Bithynia tentaculata*,' by Prof. A. E. Boycott.

NEW AND INTERESTING YORKS. HYMENOPTERA.

WM. J. FORDHAM, M.R.C.S., L.R.C.P., F.E.S.

THE following insects apparently have not previously been recorded for Yorkshire and are a small selection from a mass of material which has kindly been determined by the Rev. F. D. Morice, M.A.,* and Mr. Claude Morley,† at various times during the last two years.

Pamphilius vafer L. Skipwith Common, on birch, June, 1919, a female of which Mr. Morice says 'only recently added to our list, but is not really new, having been usually recorded (? wrongly) under the name *depressus*. Possibly *vafer* and *depressus* are only races of one species, which in that case must be called *vafer*, the older of the two names.' *Depressus* has not been recorded from Yorkshire, and the nearest locality for *vafer* is Sherwood Forest.

Empria pulverata Retz. Lonsdale, Cleveland, bred from a larva found on January 25th, 1908, under alder bark. The larva pupated in a hollow gnawed out on the inner surface of the bark. The emerging sawfly was a female, and Cameron (*Brit. Phyt. Hym.* I., p. 211) says that the male has not been discovered, and he thinks that parthenogenesis is the rule in this species.

Emphytus calceatus Kl. Bubwith, 1919.

Pachyprotasis variegata Kl. One female of this rare species was taken by sweeping umbellifers by the river at Bubwith, in June, 1919.

Spathius exarator L. A male and female of this *Braconid* were taken at Saxton, in July, 1918, on a window, by Rev. C. D. Ash, M.A. It is recorded as a parasite of the beetle *Anobium domesticum*.

Apanteles lacteipennis Curt. Mr. Morley queries as this species some specimens bred out by Mr. Ash, from Skipwith larvæ of *E. russula*, in June, 1918.

Monodontomerus nitidus Newport. Saxton, 1918, Rev. C. D. Ash.

Cratichneumon gravenhorsti Fonsc. Melbourne, E. Yorks., June, 1919, probably a variety of *fabricator*, but there are as yet few British records.

Perithous divinator Rossi. Saxton, 1918, Rev. C. D. Ash. This preys on various Fossors, and has been thought to devour larvæ of *Cynips kollari*. (*Fitch. Entom.*, 1880, p. 258). Mr. Morley gives an account of its habits in *British Ichneumons*, III., p. 48.

Pimpla punctiventris Th. Rosedale, Cleveland, flying with *Coccyx vacciniana*, 1919 (T. A. Lofthouse).

* Sawflies. † Ichneumons, etc.

1920 June 1

Clistopyga incitator F. Saxton, 1918 (C. D. Ash). Askham Bog, July, 1918 (W. J. F.).

Homocidus cinctus Gr. Bubwith, 1919.

Mesoleptus macrodactylus Hlgr. (?) Melbourne, June, 1919.

Paniscus latungula Th. This has not previously occurred north of Suffolk. Ingleby, Cleveland, May, 1915 (T. A. Lofthouse). South-west Yorks.; July, 1918 (B. Morley).

——:o:——

FIELD NOTES.

Microlejeunea ulicina at Ingleton.—I have gathered this minute hepatic several times in the last two years in the glens at Ingleton. Lees' *Flora of West Yorkshire* gives no record for this place. It is probable that on investigation the plant would be found to be far more widely distributed than at present supposed, as it is very inconspicuous, and to the naked eye, except on close scrutiny, resembles a growth of Pleurococcus.—F. E. Milson.

Melanistic Woodcock in Yorkshire.—On the 2nd Jan. last, in Beckdale, one of the valleys leading down to Helmsley from the north, I saw a Woodcock of the very rare melanistic variety. I had a snap shot at it through trees, and as showing how dark the plumage appeared, my loader exclaimed, 'I thought you fired at a Waterhen.'! But after he was out of shot, we both had a clear view of the bird winging his way up the valley, and, against a background of young larches, he appeared of a dark slate colour. I saw the bird once more later in the day, when the beaters brought the valley side down to us again; but he passed low over another 'gun,' who was standing in a narrow ride and never saw him. Pied, white, and cream-coloured varieties are not nearly so rare as the black or blackish form of the Woodcock. Dresser ('Birds of Europe') says that he never saw one, but states that, on two or three occasions the black variety has been obtained in this country, and he refers to a case which occurred in Denmark. Mr. Ogilvie Grant tells me that, in his long experience in the 'Bird Room' at the Natural History Museum at South Kensington, he only remembers seeing one skin of this dark form,* which was shown him by the owner, whose name he has forgotten. The melanoid variety of the Common Snipe, though rare, is sufficiently well known to have formerly gained the name of 'Sabine's Snipe,' and was considered a distinct species.—W. H. St. Quintin.

* Since I wrote the above, I have heard from Mr. J. H. Gurney that he recollects a 'black' variety of the Woodcock being shot many years ago near Cromer, by a member of the Buxton family; possibly the one seen by Mr. Ogilvie Grant.—W.H.St.Q.

YORKSHIRE NATURALISTS AT SKIPTON.

THE members of the Yorkshire Naturalists' Union held their 284th meeting at Skipton, the ancient capital of Crāven, during the Easter week-end, Saturday, April 3rd to Monday, April 5th, and were joined by members of the Yorkshire Geological Society.

The geologists, particularly, had a splendid time, and they had the advantage of the leadership of one of the Past-Presidents of the Union, Dr. Wheelton Hind, B.Sc., F.G.S., who, in the field, demonstrated the life-zones of the Pendleside series.

On the Saturday, under his able guidance, the whole of the Carboniferous sequence from Haw Bank, Embsay, to Eastby were examined. On the following day those from Rylstone to Grassington, and on Monday from Cononley, through Lothersdale and Raygill, returning by way of Park Head to Carlton.

On the Saturday evening Dr. Hind delivered a delightfully instructive lecture upon the work performed by the geological party during that day, and what was intended to be done during the remaining time of the meeting, illustrating his remarks by a series of blackboard sketches.

The other naturalists were each day under the guidance of Mr. T. H. Holmes, whose knowledge of the topography of the surrounding country was especially useful. On the Saturday, Skipton Castle Woods first received attention, and afterwards parties visited Embsay, Eastby, and Halton East, returning from Bolton Abbey Station. On Sunday the first area of investigation included the hedgerow banks bordering the old highway leading from Skipton to Gargreave as far as Sturton. Vegetation was fairly well advanced, the most conspicuous feature being the abundance of the sweet violet. The remains of the Stocks and the old Cock-Pit at Sturton were inspected. Proceeding by Bog Lane, the party eventually emerged on to the Grassington highway near to Nongoby Hall, subsequently following the course of the stream up Waterfall ghyll for about a mile, ending with an investigation of the adjacent Nettlehole Woods. Monday was spent on Rombald's Moor, including an inspection of the belt of woodland known as Back Plantation, working back to Skipton down the ghylls. The attendance at the excursion was exceedingly good, and as the weather was favourable, the field work was greatly enjoyed.

The general meeting held at the close of the excursion on Monday was presided over by Prof. J. H. Priestley, B.Sc. The recorders of the various sections presented their reports, and cordial thanks were accorded to Dr. Wheelton Hind for

the excellent and generous services rendered by him. Thanks were also accorded to the Duke of Devonshire, and Lord Hothfield for permission to visit their estates; to the Skipton Rock Co., Ltd., Messrs. John Green & Sons, Ltd., and Mr. P. W. Spencer for permission to visit their quarries; to Mr. Riley Fortune for making the local arrangements, and to Mr. T. H. Holmes for his able guidance and services generally.—W.E.L.W.

GEOLOGY.—Mr. John Holmes writes :—The object of the geologists was to examine the whole Carboniferous sequence in the district, and to search for evidence in support of the theory that the greater portion of the Avonian sequence is represented here: the *Dibunophyllum*-limestones being replaced by calcareous shales.

The denuded anticlinals of Haw Bank and Lothersdale belong to the Clitheroe system of folds, the oldest beds in each case form a ridge in the centre of the valley, while the limestones and shales of the Pendleside series occupy the higher slopes.

At Haw Bank, visited on Saturday, the limestones forming the centre of the fold have been quarried along the strike of the beds for a considerable distance, thus exposing large areas of the old sea-floor. The surfaces of these beds yielded many species of corals and brachiopods, which Dr. Hind was able to refer to a zone low down in the series. In the little valley between Haw Bank and Embsay, down which the stream flows, no exposures of the underlying rocks were seen. A careful search may result in exposures on this horizon being found elsewhere in the locality. Ascending Embsay Beck several fossils belonging to higher zones were collected from the shales.

Near the Spindle Mill the Pendleside Limestone was examined, and several corals, chiefly *Zaphrentis amplexiforme* were found. The upper beds of the limestone consist of crinoidal detritus, a feature noted at several exposures. Higher beds being obscured by the reservoir, the party crossed over to where another stream cuts through the limestone near Embsay Kirk. Here the detrital bed was seen to be capped by a bed of "bullions" and succeeded by black shales containing *Glyphioceras striatus* and *Posidonomya becheri*. Eastby Beck was next visited, and here the whole sequence of the Pendleside series was seen in continuous section.

The Pendleside Limestone forms the lower waterfall and is succeeded by black shales containing *Glyphioceras striatus*, *P. becheri*, *Nomismoceras rotiforme* and many other fossils. Higher up *G. striatus* is replaced by *G. spirale*, which is in turn succeeded by *G. bilingue*, before the shales become sandy

and pass up into the Upper Pendle Grit which forms the waterfall at the head of the ravine. It had been arranged to follow the Pendleside series further eastwards, but time did not permit, and the party returned to Skipton.

On the following days confirmation of the Pendleside zones was seen at several places. *Prolecanites compressus* was found at Rylstone Quarry and the zone of *G. striatus* was located at Cracoe Beck, Park Head, and east of Skipton, near Whinnygill Reservoir. In Lothersdale it was noted that the Pendleside Limestone was not so fossiliferous as in exposures north of Skipton. The limestones of Raygill are probably of *seminula* age, but owing to the scarcity of fossils their exact horizon is difficult to determine. On the way back to Skipton an exposure in the black shales near the village of Carleton yielded *Posidoniella laevis* in plenty and a few crushed goniatites.

Vertebrate Zoology.—Mr. H. B. Booth writes :—The date was rather early in the season for the ' birdy ' section. Three of the summer migrants were seen, all that could be expected. These were the Wheatear, Ring Ouzel (only the vanguards of each species had arrived, as much suitable ground was traversed), and a Chiffchaff was heard singing at Embsay (doubtless a passing bird). A single Redshank and six male and six female Mallards were noted at Embsay reservoir, which looked as though the ducks had not yet commenced incubation. We were shewn a mounted specimen of the Oystercatcher by Mr. H. F. Price, of the Cavendish Arms, at Embsay. He had shot it in a field near the village ten years ago.

On the moors, Curlews were much in evidence and very noisy. Lapwings were very busy ' rolling ' holes in the ground—some of which would later contain nests and eggs, but no eggs were seen. Grey Wagtails were numerous on the steep ground behind Skipton Castle. At the back of the castle there is a large rookery, and it was possible to look into a few of the nests at very close range from the castle roof.

In the mammals the chief item of interest was the Badger. For forty years at the least it has been uncommon in this district. In recent years it has tried to establish headquarters here—chiefly at White Crag, Silsden, where, however, it has been continually dug out, or otherwise destroyed, but we learned from several inhabitants, and also from the local gamekeeper, who was waiting to receive us, that Badgers have greatly increased in Crookrise Wood during the last ten years. This wood, being on a steep slope, and owing to the falls of rock and dense growths of timber, provides an impenetrable fortress for the Badgers, and provided they can obtain a plentiful supply of food in the neighbourhood, this wood will probably

become their chief emporium in this district. Of late years the Badger has considerably increased in Upper Wharfedale as well. Crookrise Wood also contained a pair or two of Foxes.

Several members were surprised to see such a large amount of frog spawn in a pond on Embsay Moor at so great an elevation.

COLEOPTERA.—Mr. T. Stringer reports that among the species noted by him were *Anchomenus albipedes*, *Calathus melanocephalus*, *Loricera pilicornis*, *Cicindela campestris*, and a few Bracheleytra.

DIPTERA.—Mr. C. A. Cheetham reports that at Airton *Syrphus lasiophthalmus*, only recorded once before for the county, was obtained on the Sallows, and also *Chilosia grossa*, an addition to the county list; this latter is very much like an Andrena, and can thus be easily overlooked.

HYMENOPTERA.—*Andrena clarkella* was plentiful at Airton, and *Bombus lucorum* and *Vespa rufa* were also seen. Mr. T. Stringer obtained a torpid specimen of *Vespa germanica* in the quarry at Rylstone.

BRYOLOGY.—Mr. C. A. Cheetham and Mr. W. H. Burrell write :—The mosses of the Haw Bank Quarry are quite typical of similar quarries in the district. On the tilted faces are two *Grimmias—apocarpa* and *pulvinata* with *Barbula muralis* and very fine *Trichostomum crispulum*, also a little *T. tortuosum* and *Encalypta streptocarpa* comprising the bulk. In the quarry visited there was very little of the *Bryums—capillare* and *pallens*, which are fairly plentiful in neighbouring localities.

On the floor, in the dryer spots, *Hypnum molluscum* is the chief; and as more moisture is found *H. stellatum* var. *protensum*, *H. cuspidatum* and *H. commutatum*.

The most interesting moss seen was *Leptodontium flexifolium* on Embsay Moor, about 1,000 ft. above O.D. Another interesting plant was *Zygodon viridissimus*, growing not on trees, but on stone walls, as is often the case in this district.

MYCOLOGY.—Mr. F. A. Mason writes :—On the first day of the meeting, Mr. Malone and I followed the route taken by the geological party, and about 20 species of fungi were noted. On the dry banks of débris in Haw Bank Quarry, Embsay, were a number of specimens of a peziza which proved to be *Acetabula leucomelas* (Pers.) Boud, a species new to the county flora.

The second day was spent working the woods in the neighbourhood of Waterfall Ghyll. A good start was made by overhauling a pile of old logs alongside Owlet House, at the entrance to the Ghyll, and here were obtained the agaric *Coprinus fuscesens* Fr., several resupinate fungi, discomycetes and

three species of mycetozoa. The greater proportion of the fungi and all the species of mycetozoa appearing in the subjoined list were seen on this day.

The last day was occupied in investigating the Skipton edge of Rombalds Moor, an area which, if disappointing in fungi numerically, yielded several uncommon species. *Cantharellus Friesii* Quel., an agaric only once previously collected in Yorkshire, was obtained by Dr. Woodhead; *Corticium praetermissum* (Karst) Bres., only once before recorded (Selby, F.F., Sept., 1918); and *Phoma strobiligena* Desm., another new record for Yorkshire, were all collected in this district.

Altogether 74 species of fungi and eight species of mycetozoa were observed and are listed below; many of them are new to the Mid. W. Division.

P. mahoniae and *P. strobiligena* were identified by Miss E. M. Wakefield, of Kew, who also kindly determined several species of the Thelephoraceae.

For the identification of *C. Friesii* and confirmation of the identity of *A. leucomelas*, I am indebted to Mr. A. Clarke.

Parasitic fungi :—

Fomes annosus Fr. On roots of Larch.
Uromyces Ficariae Lev. Teleutospores on leaves of Celandine.
U. Poae Rabh. Æcidia on leaves of Celandine.
Puccinia Lapsanae Fckl. Æcidia on leaves of Nipplewort.
P. tumida Grev. (=*P. Bunii* Wint.). Uredo and teleutospores on Earthnut.
P. Chaerophylli Purt. Æcidia on *Anthriscus sylvestris*.
P. Malvacearum Mont. Teleutospores on Hollyhock.
Phragmidium Fragariastri (D.C.) Schröt. Teleutospores on Barren Strawberry.
Tricoscypha (=*Dasyscypha*) *calycina* (Schum.) Fckl. On branches of Larch.
Synchytrium Mercurialis (Lib.) Fckl. On Dogs Mercury.
Phyllosticta Mahoniae Sacc. On *Mahonia aquifolium*.
Phoma strobiligena Desm. On Pine cones.
Isaria farinosa Fr. On a lepidopterous pupa.
Schinzia Alni Woronin. On roots of Alder.

Saprophytic species occurring on fallen timber and undergrowth, or on the ground :—

Clitocybe phyllophila Fr.
Mycena galericulata (Scop.) Fr.
M. alcalina Fr.
M. epipterygia (Scop.) Fr.
Cantharellus Friesii Quel.
Galera tenera (Schaff.) Fr.
G. hypnorum (Schrad) Fr.
Tubaria furfuracea (Pers.) W.G. Sm.
Psalliota campestris (Linn.) Fr.
Stropharia semiglobata (Batsch) Fr.
S. inuncta Fr.
S. coronilla (Bull.) Fr.
Hypholoma epizanthum Fr.
H. fasiculare (Huds.) Fr.
H. hydrophilum (Bull.) Fr.
Psathyra corrugis (Pers.) Fr.
Coprinus fuscesens Fr.
C. niveus (Pers.) Fr.
C. radiatus Fr.
C. ephemerus Fr.
Anellaria separata (Linn.) Karst.
Panaeolus papilionaceus (Bull) Fr.
P. campanulatus (Linn.) Fr.
Polystictus versicolor (Linn.) Fr.
Irpex obliquus (Schrad) Fr.

Stereum hirsutum (Willd.) Fr.
S. purpureum (Pers.) Fr.
Corticium sanguineum Fr.
C. subcoronatum von Hoen. and Litsch.
C. praetermissum (Karst.) Bres.
Coniophora puteana (Schum.) Fr.
Peniophora hydnoides Cke. and Mass.
Tremella mesenterica (Ritz.) Duby.
Dacryomyces deliquescens (Bull.) Duby.
D. stillatus (Nees) Fr.
Nectria cinnabarina (Tode.) Fr.
N. episphaeria (Tode.) Fr.
Leptosphaeria (*Heptameria*) *acuta* (Moug. and Nest.) Schrad.
Diatrypella quercina (Pers.) Nke.
Diatrype stigma (Hoffm.) Fr.
D. disciformis (Hoffm.) Fr.
Xylaria hypoxylon (Linn.) Grev.
X. carpophila (Pers.) Fr.
Rhopographus Pteridis (Sow.) Wint.
Acetabula leucomelas (Pers.) Boud.
Cheilymenia (=*Lachnea*) *stercorea* (Pers.) Boud.
Ascobolus Crouani Boud.
A. stercorarius (Bull.) Schröt. (=*A. furfuraceus* Pers.)
Coprobia (=*Humaria*) *granulata* (Bull.) Boud.
Helotium virgultorum (Wahl.) Karst.
Dasyscypha nivea (Hedw. fil.) Sacc.
Hyaloscypha (= *Dasyscypha*) *hyalina* (Pers.) Boud.
Mollisia cinerea (Batsch.) Karst.
M. melaleuca (Fr.) Sacc.
Stegia Ilicis Fr.
Rhytisma acerinum (Pers.) Fr.
Phoma herbarum West.
Botrytis cinerea (Pers.) Fr.
Cladosporium herbarum Link.
Stilbella fimetaria (Pers.) Lindau.

Mycetozoa :—

Badhamia panicea Rost.
Comatricha nigra Schröt.
Lycogala epidendrum Fr.
Trichia affinis De By.
T. decipiens Macb.
T. Botrytis Pers.
Arcyria denudata Sheld.
Perichaena corticalis Rost.

——: o :——

Sir William Gray, Bart., has given his residence, 'The Willows,' to West Hartlepool for the purposes of an art gallery and museum, and has undertaken to defray the cost of extensive alterations which will be necessary. When these are completed the building will be handed over to the Corporation, and will be known as the 'Gray Art Gallery and Museum.' In addition to the gift of the building, Sir William intends giving a permanent collection of British and foreign paintings to the institution.

The Annual General Meeting of the Darlington and Teesdale Naturalists' Field Club was held on April 27th. The Treasurer's Report showed a balance in hand of £17 9s. 2d. against £23 1s. 1d.; the decrease in the balance is accounted for by the purchase of entomological cabinets to the value of £20 9s. 5d. The Treasurer, Mr. W. R. Wooler, resigned owing to ill health; a hearty vote of thanks was passed to him for his past valuable services. The Hon. Secretary reported a successful session, six excursions having been held, at all of which good work was done. In commemoration of peace an oak tree was planted in the South Park by the President of the Club, on July 22nd, and at the present time it is doing well. Weekly evening meetings were held throughout the year, at which eighteen lectures and papers were contributed, many of them most interesting and instructive; the attendance was about the average. Six popular lectures were held during the winter under the joint auspices of the Mechanic Institute and the Club, and they proved a great success. It has been resolved to observe October 21st in each year in future as Arbor Day to plant one or more trees in suitable places. The total membership is now 100. The officers elected were:—*President*, E. O. D. Gibson; *Treasurer*, R. H. Sargent; *Secretary*, J. E. Nowers, 6 East Mount Crescent, Darlington.

Naturalist,

POLYLEPTA LEPTOGASTER WINN., IN YORKS.

A CAVE-DWELLING DIPTEROUS LARVA.

C. A. CHEETHAM.

In the April issue of *The Naturalist* numbers of larvæ were instanced in a cave near Giggleswick. Mr. F. W. Edwards, B.A., of the British Museum (Nat. Hist.), to whom some were sent, suggested that they possibly belonged to *Polylepta leptogaster* Winn., which is well known to have developed the habit of dwelling in caves,* but he stated that this is a very rare British species. They proved too difficult to rear, as their food supply is a problem, the bare stone sides of the cave are apparently quite free from vegetation, though possibly plant dust may blow in, and there seems to be some unicellular alga or possibly lichenoid matter when the surface is scraped off and examined. However, on a recent visit (April 17th, '20), the larvæ had practically all gone, and in their place numbers of pupæ were seen hanging head downwards suspended by a short (3-5 mm.) thread from projecting edges of the rock. The larva leaves a slime track when moving, and several strands of this provide the thread, the empty larval skin being partly on this and partly on the end of the pupa.

Three flies were found already emerged, and many of the pupæ have since hatched out, and confirmed the supposition that the fly is *Polylepta leptogaster* Winn.

Mr. Edwards has placed specimens in the collection in his charge, as it was not previously represented there.

Schmitz has figured the larva, and his diagrams are reproduced by J. R. Malloch,† but the pupa has not been described. This is a dark livid colour, about 5 mm. long and 1.75 mm. wide in the broadest part; the general shape and appearance are similar to Malloch's figures (Pl. XXXVII.) of other Mycetophilid pupæ, as Leia, Exechia and Mycoma.

It is roughly papillose with microscopic setulæ, the antennæ extend to the base of the fore coxæ, the wings are short, extending only slightly beyond the base of the third abdominal segment, a character which will serve to differentiate it from Leia, etc. Centre pair of legs extending to the base of the 8th segment, the next pairs gradually decreasing, leaving the outer terminating at the middle of the 7th segment.

Evidently the larvæ feed during the winter months, as they were plentiful on Feb. 7th, and until March 27th; they had, however, mostly pupated on April 17th.

---

* Schmitz, H., Biologisch-anatomische Untersuchungen an einer höhlenbewohnenden Mycetophilidenlarve, *Polylepta leptogaster*, Winn. Natuurhist. Genootschap in Limburg, Jaarboek, 1912.

† Preliminary Classifi. Diptera upon larval and pupal characters. Bull. Ill. State Lab. Nat. Hist., Vol. XII., Article iii.

A LIVERWORT-EATING LARVA.

C. A. CHEETHAM.

PLATE I.

It is well known how seldom liverworts and mosses are eaten by animals; occasionally the young fruits and setæ are devoured by snails, but this is so seldom as to always call for remark.

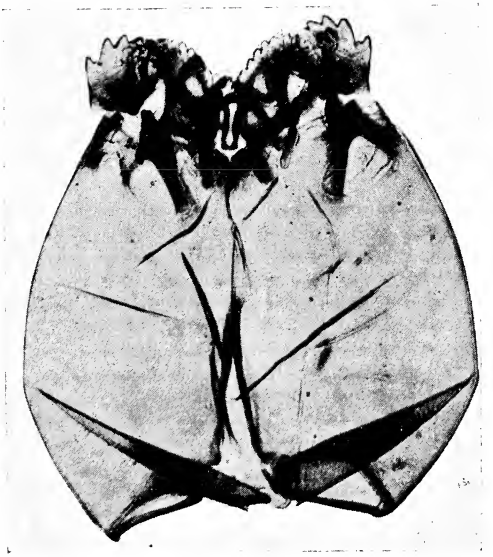
Under these circumstances the discovery, in dark corners at the entrance to Clapham Cave on March 7th, of several plants of *Reboulia* eaten away to the surface from below seemed to require investigation; a slime track could be seen, but the animal leaving it was difficult to find—eventually two larvæ, in appearance like the Polylepta larvæ, were collected. As food supply ran short and Reboulia was not available, Pellia was supplied, and one larva fed on this, and on March 23rd was seen to be making a web-like mass from the slime track matter; it pupated in the centre on the 25th, and the perfect insect emerged during the Easter holiday, April 2nd to 6th. Mr. F. W. Edwards kindly identified it as *Boletina inermis* Lundst.

The larva and pupa of Boletina do not seem to have been described; in this case the larvæ were similar to Polylepta in shape and appearance, but longer and stouter, with a larger and darker head; it can move relatively quickly backwards or forwards through the slime track, which is really a tube. Unfortunately only two were found, and one of these died early on, the body being useless for examination. A photograph of the head is given—it is in general detail like those of Mycoma and Polylepta, the mandibles, which can be seen outside the maxillæ, are somewhat intermediate between Malloch's figures of those of Mycoma and Polylepta, the second tooth being the strongest and the first tooth having a small serration at the base. Details of the pupa were difficult to see through the cocoon, which is shown in the photograph fixed between the side of a petrie dish and some Pellia; the thickenings where two or more of the strands of slime cross are a noticeable feature, possibly owing to the slime tube being there prevented from collapsing.

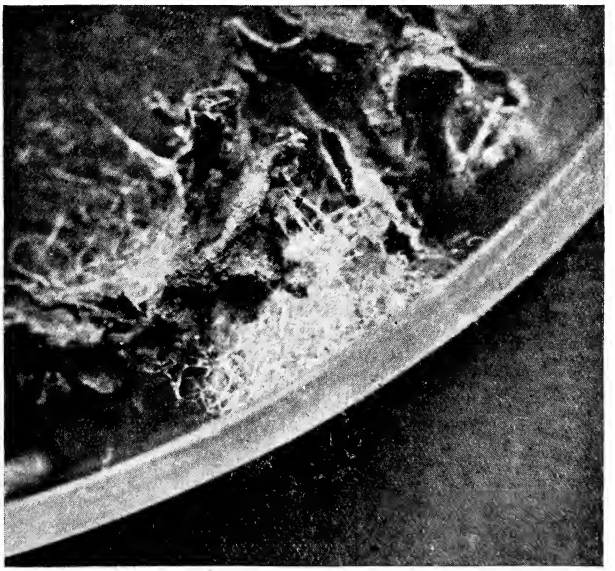
Microscopic examination of the empty pupal case shows that it is 6-7 mm. long, papillose, with microscopic setulæ, the antennæ short, extending just beyond the wing base, the wings short reaching hardly to the base of the fourth abdominal segment, the inner pair of legs are the shortest, reaching midway between the base of the 5th and 6th segments, and the longest outer pair to the base of the 7th segment; six pairs of spiracles are present.

Another closely related species, *Mycomyia tenuis* Wlk., was taken at the same time and my thanks are due to Mr. Edwards for this identification, as well as the above-mentioned assistance.

Naturalist,



Boletina inermis Lundst. Head of larva.



Cocoon of Boletina.

THE EFFECT OF PRESSURE ON A CONGLOMERATE IN HOLE BECK, SEDBERGH.

J. A. BUTTERFIELD, M.SC., F.G.S.

In Hole Beck, a small stream flowing into the Clough River, about two miles E.S.E. of the town of Sedbergh, a splendid section of Basement Carboniferous Conglomerate is exposed, showing interesting results of the effect of earth-movement on a conglomerate. A similar case has been described by Dr. J. E. Marr in similar deposits near Melmerby (Cumberland).*

The conglomerate is exposed for nearly a quarter of a mile, forming the bed and sides of the stream. The exposure forms part of an offshoot of the main mass of conglomerate of the Sedbergh area, lies unconformably on the Silurian rocks to the west, and is faulted from the Carboniferous rocks of the east by the Dent fault (downthrow to the east). The southern boundary is also a faulted one. Both junctions are well shown in this section.

The exact relationship of these conglomerates to the beds above and below has been the subject of some discussion, but the work being undertaken by the writer at the present time in this and neighbouring districts† has convinced him that whilst the junction between the Silurians and the Basement Conglomerates is unquestionably an unconformable one with a long lapse of time represented by it, there is distinct evidence of a transition from the conglomerates into the overlying Carboniferous Series. The conglomerates and sandstones, of which there are two somewhat distinct types, represent a set of conditions which heralded in the Carboniferous period in the north-west of England, and they are preferably to be regarded as transition beds, though some of the lower portion of these beds in the Sedbergh area may very possibly be of Old Red Sandstone date.

In Hole Beck the deposit practically entirely consists of conglomerate, the pebbles varying very much in size from mere grains up to boulders 3 feet across. Most of the latter are rounded or sub-angular, and consist chiefly of local rocks with a few igneous rocks (mica-traps, etc.). The petrological contents, however, will be treated in a later communication. It is very difficult to detect any signs of bedding, though there certainly is a differentiation into coarser and finer layers, the latter appearing as 'smear-planes' where, as the result of

* Notes on a Conglomerate near Melmerby (Cumberland). J. E. Marr, *Q.J.G.S.*, LV., pp. 11-13, 1899.

† This work is being carried out by the aid of the Daniel-Pidgeon Fund Grant (1918) of the Geological Society of London.

1920 June 1

pressure, the finer material has been smeared out in bands between the more resisting portions of the deposit. The strike of these 'smear-planes' at the points examined by the writer suggested a parallelism with the strike of the Dent fault at this place. However, on all sides are evidences of very severe crushing, and the following are some of the chief points worthy of observation.

1. *The 'smear-planes' or planes of movement in the conglomerate*, where the matrix has been smeared out. Their strike is roughly parallel to the Dent fault at the northern end of the exposure, though further south up the beck this strike swings round, and is probably controlled by the fault which crosses the beck and terminates the exposure at its southern end.

2. *The great development of calcite.* In many cases this forms the sole matrix, the isolated pebbles being embedded in it. In others the calcite merely forms a film on the pebbles. In nearly every case, however, and especially where it forms a film on the pebbles, evidence of slickensiding can be observed on it, and at times there are several planes of slickensiding in the same piece of calcite, when split open, parallel to each other.

3. *The pebbles in the conglomerate are in many cases beautifully striated and faulted or fractured.* Nearly every pebble examined shows this feature more or less. The pebbles are generally not faulted singly, but show many parallel lines of fracture, each fracture throwing the portion of the pebble a little further back, thus giving it a stepped appearance. Some pebbles, however, have suffered a twisting motion, whilst others have had the central portion pushed forward whilst the extremes have remained relatively stationary (miniature examples of trough faults). The pebbles, though fractured, are generally intact, the different portions having been welded together by the heat produced in shearing, or in some cases cemented by calcite. Often the fracture is quite open, and the two parts are held together by the matrix. One pebble, shaped like a cigar and of about the same size, had eight distinct fracture planes, all parallel, and each with a throw of about one-sixteenth of an inch. Some of the fractured pebbles have been bent, in which case the fracture is closed on one side but quite open and infilled with matrix on the other.

Besides this fracturing, most pebbles, except those of coarser composition, show well-marked striations. These are fine, parallel striations, close together and dependent to some extent on the shape of the pebble, for in one large boulder examined, whilst the general direction of striation was that of the long axis, towards the sides the striations ran off, as if the striating material had glided off the edges. In such cases the striations are often curved. In the smaller pebbles, how-

ever, the direction is fairly constant. In some instances the striations end abruptly at the fractures.

A most interesting fact is brought to light when the striations and fractures are viewed together and on the same pebble, for it is observed that the striations are in practically every case at right angles to the fractures. This is what one would expect in a pebble fractured and straited by differential movement in the matrix of a conglomerate. The interest is aroused even more by one pebble which contained two sets of fractures and two sets of striations. In each case, each set of fractures had its corresponding set of striations at right angles to it, one set of striations, the first to be imprinted, being much feebler than the other set. This suggests rather an interesting point. This particular deposit, according to the writer's mapping, has been affected by two faults. Does each set of the above fractures and striations represent the effect of one of these faults? If so, since it is easy to see which of these striations were the last to be implanted, if such a pebble can be found *in situ,* then it would confirm the relative age of these two faults.

4. *The matrix is itself in many places striated.* This fact has a very important bearing on the mode of accumulation of these deposits; see the suggestion as to glacial origin below, and reference.

5. *Many of the softer pebbles show curious indentations.* These, in the form of small hollows, generally quite rounded and often containing a thin film of calcite, are the impressions caused by some small pebble of very hard texture having been forced into a larger and softer pebble.

6. *Many pebbles are to be found greatly crushed and flattened.* It is evident that in the compression these softer pebbles have found themselves between two harder and larger ones, and have left proof of such compression in their present crushed and sheared appearance. Sections are being made of some of these in order to ascertain what internal effect on structure and minerals this pressure may have had.

Although this exposure has been taken as a typical one, the above phenomena can be observed in most of the exposures of Basement Conglomerate in this district, which are close to a fault. If, also, a comparison is made with Dr. Marr's paper, previously mentioned, it would seem that this feature is fairly general. These conglomeratic deposits, acted upon by pressure, seem to have re-adjusted themselves internally, rather than to have undergone much folding. In one exposure in Hebblethwaite Hall Gill (junction with Nor Gill) the pebbles in the deposit close to the fault have their long axes vertical, and here again show evidence of fracture, etc. Owing to the fact that in these areas the Basement Conglomerates are not

1920 June 1

hard and compact throughout, such internal movement is possible, and the whole explanation seems to rest upon a differential movement within the conglomerate itself, caused by some external force. This has been the Dent fault.

In conclusion, reference may be made to the old suggestion that some of these deposits, containing striated pebbles, were of glacial origin,* though the writer does not wish to dwell on a subject upon which the late Prof. Mc. K. Hughes threw doubt 50 years ago, by a consideration of these same deposits.†

When, as in some cases happens, these conglomerates are overlain by glacial material, often coloured red for some distance up, it is extremely difficult to draw a line of division between the two. But if any one who has any doubts will visit a real exposure of these conglomerates, taking into account all the points mentioned above, he will see that the true explanation of the striae on the pebbles is not a glacial one.

——: o :——

CORRESPONDENCE.

BIRDS OF THE EASTBY DISTRICT.

Mr. Rowan (page 153) records the Rock Dove at the Halton Moor Quarry on the 1st and 2nd May. Is he quite sure of his identification of this species, if so, it is an interesting record for a locality so far inland? I have found that the domestic species which has taken to breeding in quarries or similar places has a tendency to revert to the characteristic light or white rump and dark wing bars of its ancestors. He further says that the Crossbill has been recorded on more than one occasion. One winter I can well remember when it was very abundant, but I have never yet found this species nesting, although a few years ago a pair, which might have nested, was about Barden during the summer. I think it will be found that the Yellow Hammer does nest occasionally, but by no means so frequently as in former years.—E. P. Butterfield.

——o——

MAGPIES, Etc.: USEFUL OR HARMFUL?

An error seems to have crept into my remarks under the above heading in *The Naturalist* for last month. It was before the War that I lived in Brittany, so that the absence of the destroying keeper there was not *propter hoc*, though I hope it continues *post hoc*. By keeper I mean gamekeeper, and he appeared to me to be absent because game was, and game was because the land was in the hands of the peasantry, who thought of nothing but cultivating it. Scattered about, however, were plantations, coverts, and some stretches of open wild-looking country, but all for some purpose, and systematically looked after, as I was told. Trees, too, were dotted all about, and the little sunken footpaths over the face of the country, with high-banked, luxuriantly growing, wild (or wild-looking) hedges on either side, out of which, at irregular and often short intervals, sprang tall trees, were paradises for small birds.

Edmund Selous, *May 3rd*, 1920.

---

* Prof. Ramsay, 'The Reader,' Aug. 12th, 1865, cited by J. Croll, 'Climate and Time,' p. 294. London, 1875.

† Notes on the Geology of Parts of Yorkshire and Westmorland. T. Mc. K. Hughes, *P.Y.G.P.S.*, Vol. IV., No. 8, p. 565, 1868.

SEX HABITS OF THE GREAT CRESTED GREBE.

EDMUND SELOUS.

(Continued from page 102).

FEB. 21ST.—At boathouse, before 6 a.m., and from the time when it first became light enough to follow their movements, observed two Grebes—doubtless the same pair—practising love-antics in the same place as yesterday. These consisted, as before, in fronting and shaking their heads at each other, and there was also the diving and coming up, with weed in the bill. I think they did this twice, but once at any rate, they held but one and the same tuft between them. Still holding it, they reared themselves up in the water but not at such a marked degree, either as yesterday or when I first saw the action in Suffolk, or as described and figured by Huxley.* A third bird obtruded itself on this couple, so that, for a little, it was no company. Then, quite quietly, one dived, and, a moment afterwards, the third party rose from the water, and flew away, in what seemed the greatest perturbation, the other reappearing, not far from the scene, shortly afterwards. Evidently this bird had been speared, beneath the surface, and since it showed no apprehension on seeing, as it must have seen, the aggressor go down, I infer that it was young and inexperienced.

Coots were noisy, and more or less active, when I came, and after it had dawned, there was a good deal of fighting amongst them, including three or four violent battles. In these, the object of either bird seemed to be to force down and hold the other under water. Two, at least, were successful in this, and, to my surprise, I did not, in either case, see the submerged bird come up again. I suppose it must have swum, for some little way, and emerged unobtrusively, amongst others, for that it had really been drowned seems too bold a view to take, and, indeed, the body, in that case, should have reappeared.

Dabchicks also showed some little warlike feeling, but it was confined to flying after one another. It was evident to me that there were several mated couples, at least, and this implies the rule.

In boat-house, again, at 4 p.m. The Grebes still at the same place, and, all at once, the glasses discover them engaged, apparently, in what Huxley has called "a bout of shaking." I noticed, however, that their heads were very close together, so close, indeed, that there was no room for

* *Proceedings of the Zoological Society*, 1914, Vol. II., pp. 514-15. Plate 2, fig. 13.

their beaks, unless they had been touching, at least, if not, as I suspect they were, interlocked. I also noticed that, in this juxtaposition, the actions of the birds were different from those which obtain in shaking proper, inasmuch as each alternately raised its head higher than the other, and then pressed down, with it, again. I say pressed because the motion was such as seemed to imply a resistence, and thus both the motion and the juxtaposition suggest the inference that nebbing is what was really taking place. There was nothing, in fact, at this period, to which the term 'shaking' could be rightly applied. Afterwards, however, when the motion had continued just about the time one might have expected it to, on this supposition, the birds withdrew their heads from one another, and then they did shake them, and the theory as to the character of these movements, which I have already advanced, again struck me as applicable. They appeared to me to be adjunct, and probably, in their origin, preliminary, to the more understandable ones of actual contact, and to have a nervous character impressed upon them. Hence, as I suppose, just as in the fighting postures of some birds, repeated and repeated automatically, to the ruin of the actual combat, from which they alone derived consequence, has come about this exaggeration of a mere subordinate action into something of higher import to the species practising it, than the more sensuous one in which it originated, and whose place it now threatens to take. It has, in fact, whilst retaining its associations, become a sort of nervous trick, nor is it, I think, wonderful that it should be mixed up with another, which Huxley calls 'habit-preening.' Preening is the most common act of a bird, or at any rate, of many birds—and the smallest interval of time is liable to be, to some extent, occupied by it. If these Grebes, therefore, in earlier days, when about to neb, in a pause of nervous tension, gave their heads a shake or two, they would have been fairly certain to give their feathers a preen or two, also, and thus we have the two things in association.* Were the bout of shaking really the foundation, as Huxley thinks,† on which the other more elaborate forms of courtship or love-action, have been built, it ought, one would think, to be a common thing, amongst birds generally, instead of something very special to the species in question. To me it seems rather an almost pathological by-product (though now in course of utilisation) of something much more radical, and, as such, comparable both to the gyrations

* The association, however it may be accounted for, has been remarked by Huxley. *Proc. Zool. Soc.*, 1914, Vol. II., p. 511.

† *Loc. cit.*, p. 511.

of the Rednecked Phalarope (which, from what I have seen of it, I cannot accept as a truly amatory form) and to those of the Japanese Dancing Mouse. A 'well-marked' variation of the ordinary head-shaking, described by Huxley, ought, I think, to be considered with reference to the above suggestion and what I have just recorded. Huxley says :—'Here the beaks are pointed somewhat downwards, the neck brought a little forward, instead of vertical, the whole head brought forward and curved over, and the ruff erected more than usual. This attitude is almost always confined to the beginning of a bout, the birds sooner or later relapsing into the ordinary position.'* My view would be that the birds, looking to the character of these actions—ought, so to speak, to have nebbed, here (just as, on many occasions, the pair I watched in Suffolk ought to have paired), but did not. Here, too, the pauses seem to be of a nervous nature, and are sometimes, at any rate, filled up with preening, as I have definitely recorded this for four occasions,† and inferentially for three others on which 'the same thing took place.' Probably therefore, it always does. Head-shaking, however, does not occur (at least I have no record of it) and this is understandable, since whilst there is nothing, here, to give a physiological readiness, so to speak, to motion in this region, preening, a constant resource, needs nothing special to provoke it.‡

After they had shaken for some time less than a minute, as it seemed to me, the performers swam away from each other, and both dived. Coming up together, each had now weed in the bill, with which they rose upright in the water, facing each other, and this time I saw plainly that, as they tossed their heads with it, from side to side, it was gradually shaken away. bit by bit. I do not think any of it was eaten, though it was impossible for me to be sure of this. This procuring of weed followed immediately upon the head-shaking, and if we suppose it to have reference through mental association, to nest-making, only, why should this very different class of activity be suggested through a sexual channel? But if pairing is associated in the birds' minds, with nest-building, because it is on the nest that it takes place, and, still more, if the nest-building instinct has arisen out of the sexual frenzy (as I think I have brought forward good evidence to show) the passage presents no difficulty.

All this time, the little Dabchicks are exhibiting no kind of love-antics, but this may only mean that they are more

* *Loc. cit.*, p. 511.

† 'He preens the feathers of his neck, again seems about to spring, preens again, and swims away.' *Zool.*, May, 1901, p. 165.

‡ See also *post.* as to this.

backward in the display of them. If, as I believe, however, they have nothing at all to be compared to these strange exhibitions, then this, too, points rather to an abnormal personal development of the latter than one along purely normal and general lines.

Though the Coots are all together, it is quite evident, now, that they are mated. One chasing and then fighting with another male, presumably, was encouraged, by its hen, who pressed after it, uttering, continuously, this bird's curious little, somewhat chiruppy note. There is, besides, a curious clicking with the bill, also very frequent, and which I have now, several times, seen made, as well as heard, for the mechanism of the click is very apparent.

FEB. 22ND.—Up at 6, and went to the boat-house. The pair of Grebes is actively swimming and diving before 7. One of them I saw in that attitude, on the water, which, on the nest, is invariably assumed as the prelude to coition. At about 7 there were some slight connubialities.

Dabchicks may, perhaps, have special congregating places amongst the withered rushes, but, at any rate, they congregate there. Looking over the roof of the boat-house this morning, as I came up, a little too incautiously, there was an instantaneous scurry, and seven or eight, or more, radiated out from one little patch. Before this—I think on the first morning, though I did not enter it—I had seen them just gathered at the end of a little tongue of brown rushes opposite the boat-house. Though several in a very small space, yet they were not very thickly clustered, and here again, it struck me that they got into pairs, though of this I could not feel quite sure.

(To be continued).

——:o:——

The English Lakes, by **F. G. Brabant,** 2nd ed. Methuen & Co., 379 pp., 6s. net. It is eighteen years since the first edition of this admirable 'Little Guide' was first published; the present edition has been revised, there are numerous illustrations by E. H. New, and several excellent maps. By the use of small, but neat and readable type, thin paper, and care in preparation, this little guide contains more useful and reliable information than can be found in many large volumes. We can thoroughly recommend it.

Through Broadland in a Breydon Punt, by **John Knowlittle** (Arthur A. Patterson), Norwich. H. J. Vince, 112 pp., 3/6 net. This little volume is refreshing and reminiscent of the freshness of the Broads, which it so well describes. Sailing, fishing, and studying Nature in all its aspects—and writing the impressions in a fascinating way, are the strong points of John 'Knowlittle,' though we know many 'knowalls,' who know far less. There is as frontispiece a portrait of the author, and we must admit it reminds us very much of the inimitable caricatures of himself with which he kindly favours us from time to time!

YORKSHIRE COLEOPTERA IN 1919.

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

THE amount of material amassed during the year towards a more complete knowledge of our County Beetle Fauna has been extremely gratifying. As far as Yorkshire is concerned twenty species have been added to the census. Mr. Carter, Bradford, has been able to add one species to the list. Mr. A. E. Winter, of Harrogate (late of Scarborough), has done good work in V.C. 65 round Hawes and Aysgarth and has added 21 species to this less-worked portion of our area. Mr. G. B. Walsh has returned to the North Riding and has made many records for the Scarborough district, which enhance the reputation of this classic locality already famous through the work done here by Lawson and Wilkinson (as recorded in Fowler's 'Coleoptera') and later by Mr. E. C. Horrell.

Nine well-marked varieties of species already in our list have been added and the new stations for the several vice counties 61 to 65 of species previously recorded are respectively 16, 8, 9, 4, and 24.

The Naturalist should be consulted for reports on the various Union excursions. Beetles were obtained at Coxwold, Ryhill and Hawes. The Spurn records are incorporated with the present list. No beetles were taken on the Pately Bridge excursion.

Mr. Stainforth adds the montane species *Miscodera arctica* Pk. and *Pterostichus lepidus* F. to the East Yorkshire list and curiously enough from a low lying locality, viz., Allerthorpe Common. *Carabus nitens* L. also occurred here. Coleopterists will remember that *Miscodera* was at one time taken practically at sea level on the Tees estuary at Grangetown by Messrs. Thompson, Walsh and the writer. This locality has been almost destroyed now by extensions of the adjacent iron works. Mr. B. D. Cumming, who took some species at Catterick last year, notes that the specimens of *Carabus nitens* L., taken by him this year in the south of England, are larger and more brightly coloured than our Yorkshire examples.

A gratifying fact has been the interest taken in the order by several recruits to the entomological ranks and some of their records appear below. The initials appended to the list are those usually given and the asterisk (*) and dagger (†) refer to new vice-county and county records respectively.

It is just possible that *Calosoma inquisitor* L. (*The Naturalist*, 1919, Sept., 292) might occur in some well wooded part of our county on oaks and a look out should be kept for it. It has previously not been recorded north of the Midlands, until the capture in the Lake District herein referred to.

1920 June 1

Messrs. E. A. Newbery and H. Britten have kindly named many species recorded in the following list :—

Cicindela campestris L. var. † *funebris* Stm. Horsforth, five specimens in May. A. E. Thornes. Hitherto the variety has only occurred singly in one or two localities, especially in Scotland. The Horsforth examples are quite black and slightly smaller in size than the type. Further search in this locality will show whether the form persists from year to year or whether it is to be regarded as a chance aberration as heretofore. There is a dark dirty green race obtained in the Isle of Wight.

Carabus nitens L. Scalby High Moor. Six, end of May. T. Stainforth, G. B. Walsh.

C. nemoralis Müll. Aysgarth, May, A. E. Winter, *65.

Leistus spinibarbis F. Bear Park, near Aysgarth, A. E. W., *65.

Bembidion bipunctatum L. Ryhill Reservoir, not uncommon. W. J. F. *63. Aysgarth, A. E. W., *65.

B. obtusum Stm. and *B. aeneum* Genn. Seven Arches, F. Rhodes, (J. W. C.).

B. atrocoeruleum Steph. Aysgarth, A. E. W.

Trechus micros Hbst. Hawes, A. E. W., June.

Ophonus brevicollis Dj. Spurn, G. B. W., Seven Arches, commonly. F. Rhodes (J. W. C.), *64.

Harpalus rubripes Duft. Bessacar, June 16th, H. H. Corbett, *63.

Amara aulica Pz. Seven Arches, F. Rhodes (J. W. C.).

A. bifrons Gyll. Near Apperley, J. Beanland, (J. W. C.).

Haliplus striatus Shp. In brackish water, Welwick, G. B. W., *61. It is gratifying to record another station for this species as its previous locality on Tees-side near Redcar, is now almost obliterated.

†*Hydroporus halensis* F. Two in a brackish stream near Welwick, G. B. W. The species has been recorded from Lincolnshire, Nottingshamshire, Lancashire, Cumberland and Raehills. These are the only North of England records for this species, which is a typical fen insect, Suffolk and Norfolk being the only counties possessing more than one locality for it, though it has also occurred in Essex and Cambridge.

H. borealis Gyll (*davisi* Curt.). Aysgarth, in the River Yore, and Hawes by scraping *algae* in Widdall Beck, A. E. W.

H. septentrionalis Gyll. Aysgarth, A. E. W.

Helophorus minutus F. (*griseus* Hbst. *affinis* Brit. Cat.). One in flood refuse from Bubwith, F. H. Day (W. J. F.)., *61.

Laccobius nigriceps Th. Aysgarth, A. E. W., *65 (det. E. A. Newbery).

†*Sphaeridium 4-maculatum* Marsh. York, Scarborough, G. B. W. Dr. Joy (E.M.M. L., 83) revives Marsham's *Dermestes 4-maculatus* which Reitter (Faun. Germ II., 367) considers a variety of *bipustulatum*. It may be known from its allies, with which it is equally common, by the form of the œdeagus. The elytra have a red humeral spot and are yellow at the apex.

†*Cercyon lugubris* Ol. (*obsoletus* Gyll). Darfield, May, Mr. Johnson, E. G. B. This is a local species, but has been recorded from the South of England and also from Northumberland and Scotland.

C. lateralis Marsh. Sheffield, J. M. Brown, *63.

†*Aleochara cuniculorum* Kr. Skipwith Common, May, in a rabbit burrow, W. J. F.

A. spadicea Er. Forge Valley. Two in a wasp's nest on the river bank, October 4th, A. E. W., and G. B. W. (*See* Fowler, *Brit. Col.* II., p. 21). One specimen of *Metoecus paradoxus* L. occurred on the same date in another wasp's nest.

Microglossa pulla Gyll. One in Robin's nest, Scalby, G. B. W.

Oxypoda lividipennis Mann, Spurn, G. B. W., *61.
O. annularis Mann (*pallidula* Sahl). Rare in stack refuse, Eston Nab, G. B. W. (Previously recorded from Scarborough, Fowler, II., 37).
Calodera aethiops Gr. Three specimens in flood refuse from Bubwith, F. H. Day (W. J. F.), *61.
†*Atheta languida* Er. This rare species occurred in some numbers in flood refuse from Bubwith, E. A. Newbery, J. H. Keys, C. E. Stott and F. H. Day (W. J. F.). The few recorded localities are all in the South of England. Mr. Keys found a few in flood refuse from Bubwith in 1918.
†*A. melanocera* Joy (Thomson?? nec *volans scriba*) teste Dr. Sharp. Bubwith flood refuse in immense numbers and an allied species apparently new, a little larger, with long narrow thorax, J. H. Keys (W. J. F.) There are apparently several species previously confused under the name *melanocera*. Dr. Joy (E.M.M., 1913, 57) considers *halophila* Th. and *volans* Scrib. as synonymous with *melanocera* and describes as new to science, *tomlini* (common in south of England), *malleus* (England and Ireland, probably common) and *obtusangula* (rare south of England). He says *melanocera* is the only member of the group with legs fuscotestaceous, with darker posterior femora and considers it not common in south of England, but common in Scotland. Mr. Walsh reports *melanocera* Thoms. taken in 1919 in rubbish at the mouth of Scalby Beck.
Volans Scrib has hitherto only occurred in the county at Bubwith and Saltburn.
†*A. malleus* Joy. (*See* above). Four in Bubwith flood refuse, F. H. Day (W. J. F.).
†*A. aubei* Bris. Mr. Day obtained four males from Bubwith flood refuse apparently referable to this species. The only records for this very rare insect are Horning Fen and Scotland.
A. nigella Er., *A. airicolor* Shp. (*mortuorum* Th.) and *A. amicula* Steph (*sericea Muls.*). Also occurred in the same refuse, F. H. Day. All three are *61. (It is interesting to note that *A. britteni* Joy also turned up in numbers for the third year in succession).
Gnypeta coerulea Sahl. Malham, J. W. C.
Myrmecopora sulcata Kies. Spurn, G. B. W. *61.
Leptusa ruficollis Er. Forge Valley, moss, G. B. W.
Oligota inflata Mann. In numbers in robin's nest, Scalby, and in stack refuse, Eston, G. B. W.
Bryocharis analis Pk. Aysgarth, A. E. W. *65.
Quedius picipes Mann. Aysgarth, A. E. W., *65.
Ontholestes tesselatus Geoff. (*Leistotrophus nebulosus* F.). Leeds, W. D. Hincks; Sheffield, W. J. F.
Philonthus sanguinolentus Gr. Aughton, in dead hedgehog, W. J. F. *61
Cafius xantholoma Gr. var. †*variolosus* Shp. Not uncommon in seaweed at the mouth of Scalby Beck, G. B. W.
Stenus argus Gr. Bubwith flood refuse, F. H. Day (W. J. F.), *61.
S. pallitarsis Steph. ditto.
†*S. incrassatus* Er. Spurn. Two specimens on the sandhills, G. B. W. This increases the range of this species which has not been taken further north than Repton and Boston.
Trogophloeus pusillus Gr. One under rubbish, Scalby Beck, G. B. W.
Geodromicus plagiatus Heer ab *nigrita* Müll. Malham, J. W. C.
Lesteva monticola Kies (*Sharpi* Rye). Aysgarth, A. E. W.
Deliphrum tectum Pk. Bingley, J. W. C.
Megarthrus denticollis Beck. One in Moss in Forge Valley, G. B. W.
Metopsia clypeata Müll. Spurn, G. B. W.
†*Euthia schaumi* Kies. Abundant by evening sweeping. Scarborough Mere, G. B. W. (*det.* E. A. N. and Col. Deville). A rare species, but widely distributed.

Thanatophilus sinuatus F. Roundhay, in dead rook, W. D. Hincks, *64.
Xylodrepa 4-punctata L. Ecclesall Woods, Sheffield, J. M. Brown.
†*Silpha tyrolensis* Laich. Aysgarth, A. E. W. A specimen of the red type form. There is also a specimen in Mr. W. Pearson's local Scarborough collection. The only previous records of this species for the county are of the var. *nigrita* Crentz (which is noted from Scarborough, York, etc.). The red form is the commoner in the highlands of Scotland.
Phosphuga atrata L. var. *brunnea* Hbst. Aysgarth, A. E. W. *65.
Ptenidium punctatum Gyll. Common in seaweed. Spurn (*61) and Scalby Beck, G. B. W.
Trichopteryx intermedia Gill. and *T. fascicularis* Hbst. var. †*laetetiae* Matth. Moss, Raincliffe Woods, G. B. W. (det. H. Britten).
Hister marginatus Er. Two in moles' nests, Raincliffe Woods, G.B.W. *64.
Hister carbonarius Ill. Aysgarth, A. E. W. *65.
†*Heterostomus pulicarius* L. (*Brachypterus gravidus* Ill.). Saltaire, J. W. C. A local but not uncommon species previously overlooked.
Epuroea obsoleta F. Hayburn Wyke, by beating, G. B. W. *62.
E. depressa Gyll. var. †*bisignata* Stm. With the last species. This variety has a large long oval black spot on the middle of each elytron (Kuhnt, p. 485).

(*To be continued*).

——: o :——

Invertebrate Palæontology—An Introduction to the Study of Fossils, by **H. L. Hawkins.** London : Methuen & Co., 266 pp., 6/6 net. This is more than a text book on fossil invertebrates, as the first section of the volume deals with the nature and occurrence of fossils ; the preservation of fossils, collecting, preparation, taxonomy, etc. Then follow ' Geological Palæontology (Stratigraphical and physiographical) and Biological Palæontology.' Then follows an outline of the sequence of Invertebrate faunas. The aim of this book is to help and encourage those to whom Palæontology affords pastime or study. While addressed to students of Geology and Zoology, its main purpose is to awaken interest in others besides those for whom Palæontology is an ' examination subject.' It is not a reasoned catalogue of genera but provides a commentary on such compilations. The illustrations on sixteen plates are original photographs and drawings by the author. The price of the volume is very reasonable.

Seventeenth Century Life in the Country Parish, by **Eleanor Trotter.** Cambridge University Press, 242 pp., 10s. net. In many ways the seventeenth century is one of the most interesting periods in English history ; and during that century the records relating to the past seem more reliable. Writing became more generally practised, printing became a common art. The author considers it ' the most troubled period in the life of our race.' She has searched various sources producing information and contributes little-known facts relating to country life three centuries ago. Her narrative is made more historically valuable by the addition of various extracts and appendices. The chapters deal respectively with the Parish as the Unit of Local Government, the Churchwardens, the Anglican Priest and the Church, the Overseers of the Poor, the Petty Constable, the Surveyor, the Labourers and Apprentices, the Rogues and Vagabonds, the Social Life of the Village Community, and the Justice of the Peace. A Bibliography and a reproduction of Blaeu's map of the North Riding (1662) are also included.

WM. FALCONER, F.E.S.
Slaithwaite, Huddersfield.

(*Continued from page 62*).

Bathyphantes gracilis Bl.

Widely distributed in Great Britain, and usually abundant, now noted for many Irish localities; abroad, France, Spain, Italy and Central Europe; in a variety of situations. *Adult* throughout the year. First record—O. P. Cambridge, Aketon, *Zoologist*, 1860, p. 6865.

V.C. 61, 62, 63, 64.—Widely diffused and recorded stations very numerous.

V.C. 65.—Y.N.U. Upper Teesdale.

B. nigrinus Westr.

Plentiful throughout the British Isles; partial to, but not confined to, damp ground, amongst herbage, moss and fallen leaves; scarcer abroad, but with a wide distribution; Sweden, France, Belgium, Central Europe, S. Russia, N. America. *Adult* throughout the year. First record—R. H. Meade, Nab Wood, Bingley, March, 1852, S.G.B.I. sub. *Linyphia pulla* Bl.

V.C. 61, 62, 63, 64.—Widely diffused and recorded stations very numerous.

V.C. 65.—Y.N.U. Upper Teesdale.

B. dorsalis Wid.

Widely distributed in the British Isles and on the Continent, and usually common; amongst grass and fallen leaves, sometimes in damp places, but more often beaten from bushes and hedges. *Adult* ♂ April to June; ♀s on till autumn. First record—R. H. Meade, Bradford, 1851, S.G.B.I., sub. *Linyphia claytoniæ* Bl.

V.C. 61.—Hornsea Mere, T.S., E.A.P.; Escrick, J.F.; Rudston, Kelsey Hill, Haltemprice Lane, T.S.; Riccall and Skipwith Commons, W.P.W., W.F.; Scampston.

V.C. 62.—Croft, E.A.P.

V.C. 63.—Bradford, R.H.M.; Saltaire Seven Arches, J.A.B.; Aire bank, Shipley, W.P.W.; Askern; Gunthwaite.

V.C. 64.—Grassington, Horton in Ribblesdale, Saltaire Park, W.P.W.; Bishop Wood, T.S.; Wharfedale from Burley to Tadcaster; Knaresborough; Chandler's Whin, York; Washburn Valley; Bolton Woods; Mickley.

V.C. 65.—Y.N.U. Upper Teesdale, Mickleton; Tanfield; Semmerdale; Aysgarth.

B. setiger F.O.P. Cb.

Very rare, on record for Newtown Moss near Penrith, Wicken Fen, Staffs, Watton (Norfolk), and more recently in Ireland. First occurrence—the author, Selby, June, 1911.

V.C. 61.—River bank above Selby, in damp ground near oil-mill, ♀; Riccall Common, one ♀.

Gen. *Poeciloneta* Kulcz., 1-1.

[Gen. *Bathyphantes* Menge ad part.]

P. globosa Wid. (*Bathyphantes variegatus* Bl.)

Widespread in the British Isles but commoner in some places than in others; abroad, Finland, Sweden, France, N. Hungary and S. Russia; beneath stones, either on the ground or wall tops, and amongst herbage. *Adult* throughout the year. First record—Miss Clayton, Ingleborough, S.G.B.I., sub *Neriene variegatus* Bl.

V.C. 61, 62, 63, 64.—very widely diffused and recorded stations very numerous.

V.C. 65.—How Gill, W.P.W.; Y.N.U. Upper Teesdale; near Buttertubs Pass.

Gen. *Leptyphantes* Menge, 14-20.

L. minutus Bl.

Widely distributed in the British Isles, common in the north of Europe but scarce in the south, occurring also in North America ; on tree trunks (sometimes beneath the loose bark), and amongst débris and fallen leaves. *Adult* late summer and autumn. First occurrence—the author, Slaithwaite, September, 1897.

V.C. 61.—Hornsea, T.S., E.A.P., H.C.D. ; Bubwith, J.F. ; North Cave, Rudston, Weedley Springs, Houghton Woods, T.S.

V.C. 62.—Middlesbrough, abundant, Normanby, Marton, J.W.H. ; Newton Moor, Ayton Village, Hole of Horcum, Falling Foss, W.P.W. ; Scarborough, R.A.T.

V.C. 63.—Calverley, S.M. ; Broughton (Skipton), woods at Shipley, Cottingley and Keighley, W.P.W. ; Bingley Woods, R.B., W.P.W. ; Bottoms Wood, Owler's Wood, Lane, Ainley Place, Merridale, Barrett Clough (Slaithwaite) ; Drop Clough ; Ripponden ; Meltham and Harden Clough ; Woodsome ; Pennyspring and Lepton Great Woods (Huddersfield) ; Denby Dale ; Deffer Wood ; Coxley Valley ; Hebden Bridge.

V.C. 64.—Sawley, S.M. ; woods at Saltaire, Bolton Woods, Newby Moss (Ingleborough), W.P.W. ; Adel ; Roundhay Park (Leeds) ; Wothersome.

V.C. 65.—Dent, F.B.

L. nebulosus Sund.

Of local distribution ; not on the Irish list, but examples have been taken in Great Britain as far north as Glasgow ; also in United States ; in cellars and outhouses ; also in the open beneath stones, amongst ivy, etc. *Adult* summer to spring. First occurrence—the author, Slaithwaite, November, 1897.

V.C. 61.—East Park (Hull), H.C.D. ; Beverley, Miss Lockyear ; Hedon, Ryde Street (Hull) in a garden, three ♀s, Cold Harbour Lane, T.S.

V.C. 62.—Middlesbrough, one ♀, and Redcar, common under stones on the beach, J.W.H. ; Scarborough, R.A.T. ; Saltburn and Ayton Village, W.P.W.

V.C. 63.—Bingley Woods, Harden, Moorhead and Hurst Wood (Shipley), Saltaire, W.P.W. ; Wilsden, R.B. ; Whetley Hill, Bradford, F. ; Slaithwaite, plentiful in cellars, etc., under stones of a rockery and overhanging ivy in gardens, and in a damp place under stones in Bottoms Wood ; Kirkheaton ; Wilberlee ; Marsh and Almondbury (Huddersfield) ; Mirfield ; Hebden Bridge.

V.C. 64.—Shipley Glen, F.P. ; Gipton (Leeds) ; Clapdale (Ingleborough).

L. leprosus Ohl.

Widely distributed in the British Isles, Europe, Africa, and Asia ; in cellars, outhouses, barns, stables, etc., usually abundant ; less commonly in the open amongst herbage. *Adult* autumn to spring. First occurrence—the author, Slaithwaite, July, 1897. The fewness of the records in some divisions is probably due to its not being sought for in its most likely habitats, viz., inside situations, the present records being mainly for the open. In my own experience it is an invariable inhabitant of old cellars, outhouses, stables, etc.

V.C. 61.—Museum yard, Hull, River Hull Bank, Burton Constable, Albion Street, Hull, T.S.

V.C. 62.—Bilsdale Head, J.W.H. ; Scarborough, R.A.T. ; Aireyholme Wood, Great Ayton, W.P.W.

V.C. 63, 64, widely diffused and plentiful in suitable situations.

L. alacris Bl. (*L. terricola* C. L. Koch).

Plentiful in Scotland, the north of England and north Ireland, but rarer in the south of the two latter countries ; in central and southern Europe, a mountain species ; also found in France, Switzerland and Scandinavia ; amongst leaves, grass, low vegetation and débris in woods. *Adult* May to October. First record—R. H. Meade, Bradford, 1851, *Zoologist*, X., 1852, p. 3678.

V.C. 61.—Scampston.

V.C. 62.—Eston, rare, J.W.H. ; Raincliff Woods, R.A.T. ; Falling Foss, W.P.W.

In V.C. 63, 64, which include the western and more elevated portions of the county, it is plentiful and widely diffused, examples having been taken in all parts.

L. zimmermannii Bert. (*L. blackwallii* Kulcz).

Common and widely dispersed in the British Isles ; abroad, on record for Sweden, Belgium, France and Spain ; in a variety of situations. *Adults* throughout the year. First occurrence—the author, Slaithwaite, July, 1897. The most abundant and most generally distributed species of the genus in Yorkshire.

L. cristatus Menge.

Widely distributed in the British Isles and on the Continent, but apparently nowhere common ; among leaves, moss and grass in dampish situations, particularly in woods. *Adult* ♂ July to December, ♀s throughout the year. First occurrence—the author, Slaithwaite, March, 1897.

V.C. 61.—Coniston Coppice, Spurn and Swine Woods, T.S.

V.C. 62.—Wilton Wood, not common, Nunthorpe, common, J.W.H. ; Hayburn Wyke, ♀, T.S. ; Levisham.

V.C. 63.—Elam Wood (Keighley), R.B. ; Cottingley Wood, Trench Wood, Lower Dungeon and Dungeon Woods (Shipley), W.P.W. ; Hebden Bridge ; Bottoms Wood, Slaithwaite, ♂s and ♀s.

V.C. 64.—Grassington, W.P.W. ; Bolton Woods, J.A.B. ; Adel Moor ; Roundhay Park (Leeds) ♂, ♀s., and Rigton, near East Keswick, ♂, ♀s.

L. flavipes Bl.

Commoner in the south of England than in the north ; rare in Ireland ; abroad, Sweden, France, Switzerland and Central Europe. First occurrence—the author, Bolton Woods, July, 1906.

V.C. 62.—Lonsdale, apparently not uncommon, J.W.H. ; Langdale End, ♂, T.S.

V.C. 63.—Roche Abbey, one ♂ ; Deffer Wood (Cawthorn), one ♂, Crossland Moor, one ♂.

V.C. 64.—Woodhall, one ♂, W.P.W. ; Boston Spa, four ♂s ; Bolton Woods, one ♂, Spa Gill Bottoms, Sawley, one ♂.

L. obscurus Bl

Widely distributed but local ; in a few Irish localities and found in Great Britain as far north as the Grampians. Abroad, Sweden, France, Corsica and Central Europe ; bushes and branches of trees, low vegetation, especially heather. *Adult*, May to August. First occurrence—the author, Dean Head, July, 1899.

V.C. 61.—Deepdale Woods (Beverley) and Houghton Woods (Market Weighton), both sexes, Bielsbeck, Birkhill Wood, T.S. ; Scampston Park, ♀s.

V.C. 62.—Old Ormesby, J.W.H. ; Thornton Dale, R.A.T. ; ♀s Scarborough Mere, Raincliff Woods, Cayton Bay, and Coathland ; both sexes, Hayburn Wyke, Boosbeck and Saltburn.

V.C. 63.—Low Crookes Wood and Hurst Wood (Shipley), Cottingley Wood, W.P.W. ; Askern ; Deffer Wood ; Bishop Wood ; woods at Huddersfield, viz., Butternab, Mag Wood, Honley Old, Mollicar, Storthes Hall and Whitley Woods ; Dean Head ; Harden Clough

(Meltham); Lepton Common; Bentley Springs (Flockton); Hebden Bridge and Hardcastle Crags.

V.C. 64.—Grassington and Shipley Glen, W.P.W.; Bolton Woods; Burley-in-Wharfedale; Adel Moor; Harewood; East Keswick; Linton Common; Stubbing Moor; Dalton Lane; Mickley.

L. pallidus Camb.

Recorded from several widely separated English and Welsh counties and the south of Ireland, not usually in any quantity; abroad, Norway, France and Central Europe; amongst moss, dead leaves and herbage, or beneath stones. In France and Bavaria, Derbyshire and Ireland, it sometimes frequents caves and other underground situations. *Adult* ♂ May to October, ♀s throughout the year. First occurrence—the author, Wessenden Valley, October, 1898.

V.C. 61.—Near Wawne, Sutton Drain and Tunstall (Withernsea) ♀s, E.A.P.; Wilberforce House (Hull), Houghton Woods (Market Weighton), ♂, Birkhill Wood (Cottingham), ♀, Brantingham Dale, T.S.

V.C. 62.—Gunnergate and Nunthorpe, not common, J.W.H.; Saltburn, Upleatham and Coatham Marshes, ♀s, Raincliff Woods, two ♂s.

V.C. 63.—Calverley, S.M.; Hurst Wood and Old Spring Wood (Shipley), Cottingley, W.P.W.; Hardcastle Crags, one ♂; both sexes, Bottoms Wood, Scout Wood, and Ainley Place (Slaithwaite), Honley Old Wood, Drop Clough (Marsden), Mollicar Woods (Huddersfield), Riding Wood and Morton Wood (Holmfirth) and Deffer Wood (Cawthorn); ♀s, Pole Moor, Wessenden Valley, Crosland Moor and Butternab Wood, Almondbury.

V.C. 64.—Shipley Glen, W.P.W.; Roundhay Park, Leeds; Rigton and Dalton Lane; Bolton Woods; Grass Woods; Grantley; Hackfall.

(*To be continued*).

——: o :——

A Picture Book of Evolution, by **Dennis Hird.** 2nd ed. London: Watts & Co., 367 pp., 12/6. net. This volume appears under different conditions from those obtaining when the first edition was published—hence the greatly increased price. It is still a cheap book. There are over 300 illustrations, carefully selected, and the letterpress is written in a manner suitable for the beginner. The author begins by referring to the evolution of the bicycle, from thence to the motor-cycle, and finally to the motor car, though his illustrations of 'the motor car,' suitable enough when the first edition was published in 1906, seem now almost as antiquated as some of the 'bone-shakers.'

An Introduction to Palæontology, by **A. Morley Davies.** London, T. Murley & Co., 414 pp., 12/6 net. This book is precisely what its title describes. It is well written, concise, and illustrated by over a hundred well chosen and clearly drawn diagrams. The first nine chapters deal with various members of the animal kingdom, beginning with the Brachiopoda and ending with the Porifera and Protozoa; Chapter VI. (The Vertebrata) being about the shortest. Chapter X. deals with The Vegetable Kingdom; XI., The Collection and Preservation of Fossils; and XII., The Rules of Nomenclature—an important item. There are also valuable appendices and a good index. As frontispiece is 'Amauroceras ferrugineum (Simpson), an Amaltheid from the Domerian of Whitby.'

YORKSHIRE NATURALISTS' UNION : COMMITTEE OF SUGGESTIONS.

A MEETING was held in the Geological Department of the University, Leeds, on May 3rd, Prof. Priestley in the Chair.

A scheme of work was discussed for Peat Investigation, and the following sub-committee, with Prof. Priestley as Chairman, was elected to deal with this :—

Peat—Water Content, Ash, etc. : W. H. PEARSALL.
,, Micro-botanical : W. H. BURRELL.
,, Fungus Content : F. A. MASON.
,, Alga Content : J. W. H. JOHNSON
General Entomology : H. H. CORBETT.
Coleoptera : J. D. FIRTH.
Subsoil-Petrographical : DR. GILLIGAN.
,, Chemical : G. F. PICKERING.

Prof. Kendall offered to provide a shelf, and help to form a small library of Peat Literature, and Dr. Forsyth undertook to arrange it, and if possible prepare a bibliography.

It was decided that the affiliated local societies be asked to report on the areas of peat in their individual districts, and to state what they can do to help in the work* ; also that they be asked to arrange for an evening in their next lecture session to be devoted to Peat, and that the Committee should endeavour to supply lecturers if necessary ; Messrs. Pearsall, Gilligan, Kendall, and Cheetham, promised assistance in this.

In addition, it was decided to invite the local societies to arrange for deputies to be present at a meeting at Moortown, Leeds, on Sept. 25th, when a demonstration of methods used in ascertaining the depths of peat deposits and of other peat investigation work will be arranged by Prof. Kendall.

The Committee were of the opinion that the success of this work was in the hands of the affiliated societies, and only by their help and enthusiasm could it be accomplished ; they are asked to send in their reports, if possible before September, to the Convenor.

A general scheme of work for the Rivers Investigation in connection with the Yorkshire Geological Society was discussed, and a small sub-committee appointed to deal with this matter. A meeting was arranged for October 23rd, at Bolton Woods, to examine the stream in the Valley of Desolation and the River Wharfe.

Further sectional meetings were arranged, one to be led by Mr. P. H. Grimshaw, of the Royal Scottish Museum, in August, for Diptera, and, if possible, one to examine the Post-Glacial Peat Deposits in Holderness, to follow the Beverley excursion. The Committee would welcome suggestions for further sectional meetings.

Convenor : CHRIS. A. CHEETHAM, Old Farnley, Leeds.

——: o :——

The Transactions, etc., of the Dumfriesshire and Galloway Natural History and Antiquarian Society, third series, Vol. VI., 231 pp., edited by R. C. Reid and Mrs. G. W. Shirley, have been received. Among the many interesting contents we note ' The Colchicum or Meadow Saffron,' by S. Arnott ; ' Note on a Burial after Cremation,' by Bishop A. Henderson ; ' The Mines and Minerals of Leadhills,' by Robert Brown ; ' The Evolution of Firearms,' by T. Dykes ; ' Sir William Jardine's " Naturalists' Calendar," ' by S. H. Gladstone ; ' G. F. Scott Elliott's " Notes Regarding Bird Life in the Stewartry," ' by T. B. Hough ; ' On Otoliths,' by Col. C. E. Shepherd. A prehistoric cinerary urn, found at Wylie's Wood, Kirkbean, is very similar in shape and pattern to many found in Yorkshire.

* A general scheme of desirable work is outlined in *The Naturalist*, 1904, p. 137 *et seq.*

NORTHERN NEWS.

Mr. W. Whitaker, F.R.S., is the President of the Geologists' Association this year, for the second time.

The Irish Naturalist for April contains a note on ' Some New and Rare Irish Spiders,' by D. R. Pack-Beresford.

A recent book catalogue offers ' Fossil Polyzoa of the *Craig*,' ' British Fossil *Corrals*,' and ' Species of *Polyparia*."

Dr. George Hickling, of the Manchester University, has been appointed Professor of Geology at the Armstrong College, Durham.

The Irish Naturalist for May is principally occupied by a paper on ' The Colours of Birds in relation to their Habits,' by C. B. Moffat.

The Twenty-ninth Annual Report of the Royal Society for the Protection of Birds well indicates the thorough extent to which this Society is doing its work.

Protoscolex latus, a new ' Worm ' from Lower Ludlow Beds, near Laintwardine, Herefordshire, is figured and described by Dr. F. A. Bather in the *Annals and Magazine of Natural History* for January.

As *Wild Life* is no longer published, Dr. F. D. Welch asks us to state that on p. 20 of that journal, issued in 1918, his description of the pupil of the eye of the European Wild Cat should have been given as *non*-circular.

The collection of vertebrate remains made by Mr. W. J. Lewis Abbott, and the collection of Girvan Fossils made by Mrs. Robert Gray, have been received by the Geological Department of the British Museum, South Kensington.

We notice in a report of a Yorkshire Art Gallery Committee that ' The Chairman submitted three paintings obtained by him at a recent sale, which he offered to the Committee at the purchase price, viz., £10 5s. Resolved—that the offer be accepted.'

The Glasgow Naturalist makes its reappearance, having been dormant during the war. Vol. VIII., No. 4, just to hand, contains : ' *Helicigona arbustorum* (Linné) var. *bifasciata* Kew, a new record for Scotland, by G. A. F. Knight ; and ' Lanarkshire and its Molluscan Fauna,' by the late W. D. Roebuck.

At a recent excursion of the Selby Scientific Society to Hemingbrough, the following extract was made from the Parish Register in the Church :—' A MEDICEN FOR MY WIFE'S LEGE.'—' A shepe head, blacke, if it can be gotten, if not, white, with wool on, boyle it in a pan or potte until ye bones com out, then take ye bones out and boyle ye flesh with wool and all together with these herbes following, namely, wormwood, watercresses, arsmart, selyer foole, barke leaves, hoorhound, camamile, isop, sage, penyriall, woolred leaves. Cut or chop all these herbes, which with ye head together and put all in ye first broth, with a handful of hole oatmeal and boyle till it be soft, and anoint, and a pultice called by the name of Hantynteves.' We presume this is an early example of ' leg-pulling.'

In *The Yorkshire Post*, Mr. H. W. Robinson writes :—' The Scottish Fresh Water Fisheries Committee, in its final report, has condemned, among other birds alleged to be destructive to freshwater fish, all species of terns, and recommends that protection be withdrawn from them. On what authority do they base such a conclusion? I have studied, very carefully, the food of terns, and handled over two thousand young ones, the majority of which regurgitated the contents of their crops. The chief food of the common tern consists of young herrings, with a fair number of whiting, and also a few young codling, lumpsuckers, and long rough dabs, and although the colonies visited were bounded by rivers famous for their salmonidæ, no trace of the young of any freshwater fish was found, either in the birds or on the ground.

Twelve Illustrations, beautifully printed in colours and Mounted on Stout Boards, 24 × 19 inches, eyeletted and strung, including Descriptive Handbook, in Leather Board Case 17/6 net the set.

BROWNS'
ENEMIES OF THE GARDEN

Reproduced in the very best style of Lithography from special designs by
H. W. BRUTZER, M.A., F.E.S.

THE 12 ILLUSTRATIONS ARE AS FOLLOWS :

1. OUTLINE OF INSECT LIFE.—Hymenoptera, Coleoptera, Lepidoptera, details.
2. LACKEY MOTH.—Egg, Caterpillar, Nest, Cocoons, Female Lackey Moth, Egg Cluster.
3. SMALL ERMINE MOTH.—Eggs, Caterpillar, Cocoons, Ermine Moth, Nest in Apple Tree.
4. GOOSEBERRY SAWFLY.—Egg, Larva, Larva (last stage), Leaf, Sawfly, Branch, Cocoon.
5. ASPARAGUS BEETLE.—Eggs, Larva, Beetle, Pupa, Asparagus stripped of leaves, Cocoon.
6. BLACK CURRANT MITE.—Mite, Big Bud on Branch, Section of Bud with Mites.
7. RASPBERRY STEM BUD CATERPILLAR.—Caterpillar, Chrysalis, Moth (enlarged), Raspberry Cane.
8. MILLIPEDES and CENTIPEDES.—Three destructive Millipedes and two useful Centipedes.
9. SCALE.—Currant Scale, Scale on Aralia and Myrtle Leaves and Mussel Scale.
10. WIREWORMS.—Click Beetle and Skip Jack showing details.
11. PEA THRIPS, COCKCHAFER, DADDY LONGLEGS, WOOD-LOUSE and EARWIG, showing sections and details.
12. SOME USEFUL INSECTS.—Dragon Fly, Ichneumon Fly, Lady Bird, Tiger Beetle, Hover Fly, Glow Worm, Cocktail Beetle, Lacewing Fly.

All the designs are printed on appropriately tinted backgrounds, devoid of any white border, thus enabling the various sections on the Charts to be seen with great clearness.

We always have enemies within our garden-gates, and would-be gardeners are often reminded that the results of their labours may be brought to nought or greatly lessened by the work of destructive insects. There are other insects, however, that are our Allies, as they live on the destructive pests and thus help to protect the vegetables and fruit. It is, therefore, most necessary to be able to distinguish between useful and destructive insects, hence the popularity of **Browns' "Enemies of the Garden,"** as the charts show at a glance how to tell our enemies from our friends. A set of the illustrations should be exhibited in all our school or village clubs, as the knowledge which they and their accompanying handbook convey is essential to successful gardening. The small expenditure on same will prove a truly profitable investment.

LONDON : A. BROWN & SONS, LTD., 5 Farringdon Avenue, E.C. 4.
AND AT HULL & YORK.

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London. June 1st, 1920.

JULY 1920. No. 762
(*No. 536 of current Series*)

THE NATURALIST

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

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;
AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, D.Sc., F.R.S., F.L.S. **G. T. PORRITT, F.L.S., F.E.S.**
Prof. P. F. KENDALL, M.Sc., F.G.S. **JOHN W. TAYLOR, M.Sc.**
RILEY FORTUNE, F.Z.S.

Contents :--

LONDON:
A. BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.
Printers and Publishers to the Y.N.U.

Price 9d. net. Prepaid Subscription 8/6 per annum.

BOOKS FOR SALE.

Beetles and Spiders. Sedgewick. 1/-
British Non-Marine Mollusca. Swanton. 1/6
Lessons on Shells. 1/6
Half Hours with the Microscope. West. 1/-
Astronomy, Clerke, Fowler and Gore. 4/-
Beasts, Birds and Bees of Virgil. Royds. 2/-
Our Country's Animals. Col. Pls. Gordon. 3/6.
Rust, Smut, Mildew and Mould. Col. Pls. Cooke. 4/-
The Animal World. Gamble. 1/-
Reptile Life. Pycraft. 2/-
The Nature Lovers' Handbook. Kearton, etc. 2/6
History of the Oxford Museum. 2/6
Medical Contributions to the Study of Evolution. Adami. 12/-
Fourth International Ornithological Congress, Proc. 1905. 1/-
Evolution in the Past. Knipe. Pls. 10/-
Aristotle's Researches in Natural Science. Lownes. 4/6
Reptiles and Fishes. Lydekker. 9/-
Turner on Birds. 1544. Evans. 5/-
A Veteran Naturalist (Tegetmeier). Richardson. 7/-
Reptiles and Batrachians. Boulenger. Pl. 12/6
Darwin and the Problem of Life. Gunther. 7/6
Growth and Form. Thompson. 17/6
Waves of the Sea. Cornish. 7/-
Waves of Sand & Snow. Cornish. 7/-
Life of Crustacea. Calmen. 5/-
Plant Life in Alpine Switzerland. Arber. 6/-
Nature Near London. Jefferies. 4/-
A Picture Book of Evolution. 2 Vols. 2/6 a vol.
Conditions of Life in the Sea. Johnstone. 6/-
British Ferns. Col. Pls. Druery. 6/6
The Further Evolution of Man. Calvert. 4/-
Life and Evolution. Hedley. 4/6
The Hare and the Red Deer. Fur, Feather and Fin Series. 2/-
Harmsworth Natural History. 3 Vols. 10/- each.
Lessons from Nature. Mivart. 4/-
Heredity. Thompson. 7/6
Darwinism and Human Life. Thompson. 4/6
Wild Traits in Tame Animals. Robinson. 5/6
The Lessons of Evolution. Hutton. 2/6
Hills and the Vales. Jefferies. 4/6
Animal Life under Water. Ward. 6/6
The Open Air. Col. Pls. Jefferies. 4/-
The Chrysanthemum. F. W. Burbridge. 2/6
Report on Agricultural Damage by Vermin and Birds in the Counties of Norfolk and Oxfordshire in 1916. R. T. Gunther. 1/6
Hunting in British East Africa. Madeira. 10/-
Spencer Fullerton Baird. By Dall. 7/6
The Greatest Life. Leighton. 3/-
The Yorkshireman. By a Friend. Vol. I., Pontefract, 1833. 3/6
Derby: Its Rise and Progress. Davison. 2/6
Animal Romances. Renshaw. 4/-
The Scientific Enquirer. Cloth. Vols. I. and III. 2/- each.
The Making of Species. Dewar and Finn. 4/-
Rambles of a Canadian Naturalist. Coloured Illust. S. T. Wood. 3/6
How to Lay out Suburban Home Grounds. Kellaway. (Pubd. at 8/6). 3/6
What is Instinct ? C. Bingham Newland. 2/6
Vigour and Heredity. J. Lewis Bonhote. 6/6

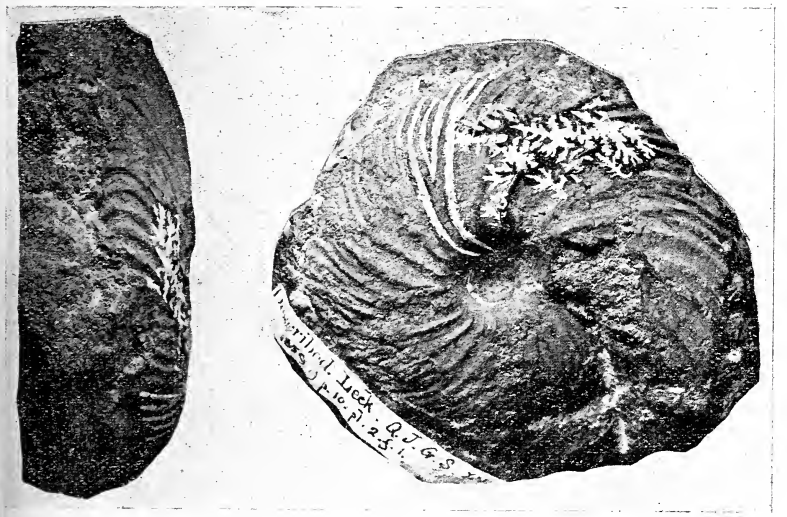
Published Records of Land and Fresh-Water Mollusca, East Riding. (Maps). T. Petch, B.Sc., B.A. 1/6
Diatomaceæ of Hull District. (600 illustrations). By F. W. Mills, F.R.M.S., and R. H. Philip. 4/6

Apply—**Dept. C, c/o A. BROWN & SONS, Ltd., Hull.**

NOTES AND COMMENTS.

TYPE AMMONITES.

Part XXI. of Mr. S. S. Buckman's work has recently appeared, and has 14 plates, from photographs, principally by Mr. J. W. Tutcher. There are some introductory remarks dealing with Chronology, Terminology and 'Systematic.' In this part there is apparently only one Yorkshire specimen figured—*A. placenta*, from the Kelloways Rock, Scarborough.



"*Ammonites placenta*, Simpson-Leckenby, 1859, Holotype. *Q.J.G.S.*, XV, 10; II, 1; "The Castle Road, Scarborough, Yorks; "Kelloway Rock"; Grey, coarse ool.; Sedgwick Mus., Cambridge (Leckenby Coll.); S. 58, 52, 34? 19. *Longæviceras placenta*, Simpson-Leckenby, sp. Collovian, *duncani*."

An illustration, (one of the smallest), we are able to give herewith.

THE GEOLOGICAL MAGAZINE.

From *The Geological Magazine* for May we learn that 'This month our Editorial notes are shorter than usual, owing to pressure of other matter on our space, especially somewhat lengthly correspondence, which has to some extent upset the original programme and caused one or two papers to be unavoidably held over. Furthermore, the incidence of the Easter holidays had made it difficult to keep up with current events in the geological world.' Why waste type and space in saying this? Telling us why the notes are shorter only makes them longer! There is an appreciation of the late Charles Lapworth; A. H. Cox and A. E. Trueman write on 'Intra-Jurassic Movements and the Underground Structure of the Southern Midlands,' and J. R. Moir tells us still

once again, but we believe for the first time in this journal, all about ' The Geological Age of the Earliest Palæolithic Flint Implements.' in which a paper of 3½ pages contains no fewer than 25 footnotes, mostly referring to that ' author's ' previous contributions in other journals. The author also kindly agrees with some conclusions made by Prof. J. E. Marr. G. W. Lamplugh has a lengthly letter replying to critics of his paper on the Gault and Lower Greensand near Leighton Buzzard, in which he concludes with ' whether Upper or Lower Gault, the statement that it is inverted runs counter to so many points of evidence recently considered in the field, that I have no hesitation in rejecting the supposition as unwarranted.' The ' Contents ' on the cover of the magazine do not agree with the actual contents inside.

CONFERENCE OF DELEGATES.

A melancholy interest is attached to the Report of the Corresponding Societies' Committee and of the Conference of Delegates of the British Association, held in Bournemouth, 1919, recently published, (44 pp., 1/-), as it represents one of the last pieces of work accomplished by H. C. Stewardson, the Clerk to the British Association, to whom bibliographers are indebted for his annual catalogue of the more important papers published by the Corresponding Societies. In addition to the report of the Conference, the pamphlet contains the address of Brigadier-General Lord Montague on ' Roads, Ancient and Modern ' ; ' Atmospheric Pollution,' by Dr. J. S. Owens ; ' The Exposure of Rain Gauges,' by M. de Carle S. Salter ; ' Geography in the Curriculum of Higher Education,' by T. W. F. Parkinson.

KETTLEWELL : PAST AND PRESENT.*

In this pamphlet the Rev. J. C. Sowerbutts prints all he can scrape together relating to Kettlewell, though the order in which his notes appear is somewhat unusual, as will be seen from the headings given below, which follow each other consecutively : ' The Craven Fault, Flora, Fishing, Craven, Historical, Domesday Book, Lead Mining, Population, Ecclesiastical, A Premonstratensian Monastery, The Dry Stone Walls,' and so on. There are some useful illustrations and a small, though good, contour map. The list of authorities is one of the most extraordinary of its kind that we have ever seen. The author seems to know, or has heard of Miall and Carrington's ' Flora of the West Riding,' but is apparently unaware of the existence of a work with that title by F. A. Lees. Reference is made to *Prof.* J. W. Davis, later on he is referred to as *Davies*, and *Davies and Lee* are hardly the correct

* York : T. A. J. Waddington. 50 pp. Price 1s. 3d.

names of the authors of 'West Yorkshire.' There is a preface by the late Prof. F. W. Moorman, who tells us that 'good wine needs no bush.'

RARE YORKSHIRE FISHES.

We learn from the 'Nature Lover's Diary' in *The Yorkshire Post*, for May 20th, that two uncommon fishes have been noticed recently on the Yorkshire coast. The first, a small specimen of the Basse (*Labrax lupus*), was taken on a hook baited with 'rag worm' at Robin Hood's Bay on February 6th. It was feeding in very shallow surf water—a common habit of this species. It measured 16 inches in length, and weighed probably two pounds. The Basse is a fairly common fish on the southern parts of our coast, but on the East Coast is seldom found further north than Flamborough Head, although occasionally individuals have occurred as far north as the Firth of Forth. The other is a very fine example of Yarrell's Blenny (*Blennius yarrellii*). This was taken in a rock pool at Filey Brigg on March 29th. It measured seven inches in length—a good size for this fish. Yarrell's Blenny is everywhere scarce, and is distinctly rare in Yorkshire waters. One was taken at Redcar in September, 1835, and is recorded in Yarrell's 'British Fishes,' while another was found at Scalby Ness, near Scarborough, on November 8th, 1897. These are, perhaps, the only reliable Yorkshire records. [The newly captured specimens have been authenticated by Mr. W. J. Clarke, F.Z.S.—Ed.].

LIVERPOOL GEOLOGISTS.

A substantial volume of Proceedings has been issued by the Liverpool Geological Society (Part 4, Vol. XII.) covering the period 1916-1919, and edited by E. Montag. It is well illustrated by plates and diagrams, and certainly speaks well for the enthusiasm of this go-ahead provincial society. The preliminary pages contain much evidence of the activity of the members, in addition to which the publication contains two presidential addresses by J. H. Milton, a presidential address by J. C. M. Given, who also writes on 'The Geological Distribution of the Primates.' Other contributions are 'The Trias of the Macclesfield District,' and 'The Distribution and Significance of Barium Compounds in Sedimentary Rocks, with special reference to the Trias,' by H. W. Greenwood; 'Notes on Pebbles in their Geological Associations,' and 'The Ancient Settlements in Wirrall,' by W. Hewitt; 'The Pebbles of the Middle Bunter Sandstones in the neighbourhood of Liverpool'; 'Notes on Some Borings recently made in Wirrall and in Liverpool'; 'Additional Petrographical Studies in Local Erratics'; 'Description of a Boring in the Lower Coal Measures and Millstone Grit near Billings, Lancs.', by T. A. Jones; 'Some Borings through the Marshes

bordering the Southern Shore of the Mersey Estuary,' by F. T. Maidwell, and ' Notes on Terminal Curvature at Billings Hill, near St. Helens,' by C. B. Travis. All are of particular local value and interest.

SCHOOLS AND NATURE-STUDY.

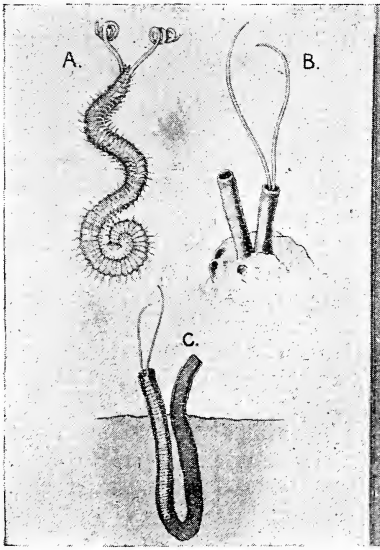
We learn from *The Eastern Morning News* that ' for many years there have been societies in Hull whose object has been to foster the love of nature, and to many of their members nature has been an absorbing interest. The members of these societies have undoubtedly exercised in a quiet way considerable influence among their fellow citizens. It is felt by many, however, that there is room in the city for a natural history or nature study club, consisting of boys from the upper standards in the schools, or of boys who have left school, who are interested in natural history. Special courses of lessons on nature study which are being given to various Hull Schools have shown that many of the scholars take a keen interest in nature, and it is thought that interest will be kept up after the boys leave school if a society is formed for their benefit. This view was expressed at a representative meeting of teachers held at the Central Secondary School. It was there unanimously resolved that an Old Boys' Natural History Club be formed in connection with the schools of the City. It was decided to form a Committee of Teachers for the purpose of placing the society on a proper basis, and of exercising an advisory function in the society's work.'

AN EXPERIMENT.

There is no doubt that at the present time the school children in Hull have opportunities which are greater now than have previously been possible. The systematic lectures to small classes of scholars, given gratuitously by the Curator of the Hull Museums, are now being continued, under the auspices of the Hull Education Committee, by Mr. T. Stainforth, until recently the Assistant Curator, who has been appointed lecturer, and all his time is occupied in these duties. Our own feeling is, however, that the more children are taught natural history, the less chance there seems to be of their developing into keen naturalists. As a result of the hundreds of lectures given to thousands of children in Hull during the past two decades, it cannot be said that the ranks of the local Field Naturalists' Society have been increased by a single member. There is no question that in general knowledge the children are benefitted, and have a broader outlook in life, but their thirst for nature-knowledge seems to end with the lectures. We shall watch the experiment of the formation of the ' Old Boys Natural History Club ' with interest, and only hope it will prove that our impression is wrong. Time will tell.

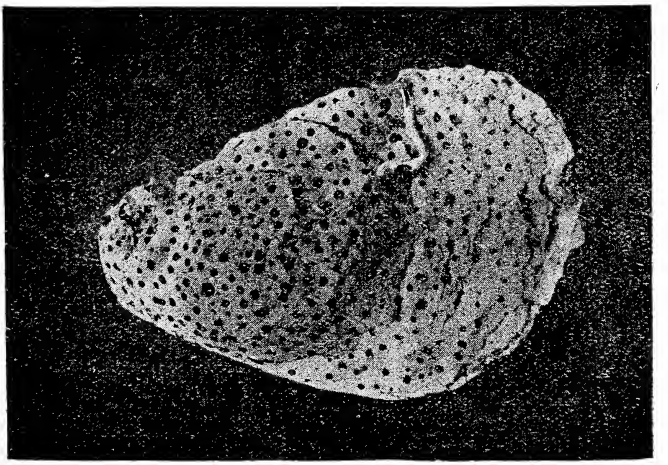
MARINE BORING ANIMALS.

As ' Economic Series No. 10,' the British Museum (Natural



A.—The worm extracted from its burrow.
B.—The mud tubes erected at the two openings of the burrow; from one of them the two tentacles of the worm are extended.
C.—Diagrammatic section of the burrow with the worm in position.

Limestone Pebble bored by *Polydora*.



Oyster Shell attacked by the Boring Sponge, *Cliona celata*.

History) has issued an admirable Treatise on ' Marine Boring Animals Injurious to Submerged Structures,' by W. T. Calman,

D.Sc., (35 pp., 21 figures, 1/-). In this Dr. Calman deals with the various forms of animal life which affect timber, limestone sea-defences, etc., and quite apart from the general information given relating to this somewhat neglected branch of natural history, the book will be of great value to engineers and others interested in marine work. We are able to reproduce two of the blocks.

BIRDS BENEFICIAL TO AGRICULTURE.

The same authority has issued a substantial pamphlet by F. W. Frohawk (47 pp., 22 plates, 2/-). From the Preface of this we learn that 'The value of the benefits conferred by Birds on Agriculture is fortunately generally admitted, and no apology is needed for efforts to facilitate the recognition of some of the best friends of the farmer, at a time when the conservation of our food-supplies is a matter of national importance. In recognition of this fact, the Trustees gave instructions for the preparation of an exhibition, in the Central Hall of the Museum, of a selection of the species believed to be beneficial to Agriculture, and for the simultaneous issue of a small Guide-book in further illustration of the subject. The work was entrusted to the well-known naturalist and artist, Mr. F. W. Frohawk.'

PICTURES OR SPECIMENS.

A writer in *The Huddersfield Examiner* says: 'Apparently the new museum committee is not going to adopt my suggestion to show birds by good paintings life size. I am told that the public prefer stuffed birds. What the public prefer is not necessarily the best—they prefer public-houses and picture theatres; they did not prefer compulsory education in 1884. But I doubt the statement, at any rate, as far as the more intelligent part of the public is concerned. Scores of cases of birds have been given to the museum at the Technical College, mostly because the owners were tired of them and wanted them out of the way. When others were put up to auction the sale had to be stopped because it was not realising auctioneer's expenses. Stuffed animals are not necessary for scientific study; and to use them for show only is but a relic of the hunting spirit we have inherited from our cave-dwelling forefathers. Mr. Johnson Wilkinson has been deputed to make enquiries and report upon the best method of dealing with birds in a musuem. Mr. Wilkinson is a member of the Royal Society for the Protection of Birds, and the matter could not be in better hands. The cost of birds stuffed and fitted up in latest style, and the sacrifice of life, is tremendous.' We believe we remember seeing 'stuffed birds' under this writer's care—and we fancy that he 'stuffed' them. We shall be glad to hear the result of Mr. Johnson Wilkinson's enquiries.

INSECTS OR DRAWINGS.

From the same source we learn that 'it has been decided that my collection of butterflies and moths is not a suitable one for the museum. . . . In these circumstances—the rejection of my collections, and the impossibility of securing other specimens with sufficient data—I do not see any immediate prospects of the rapid growth of a new museum.' Perhaps the new committee is going to shew the insects by good paintings, life size? Surely the 'sacrifice of life' to obtain the necessary insects to form a collection is as 'tremendous' as if the specimens were birds? Or does the writer believe that birds have feeling and insects have not—or that insects are harmful while birds are not?

BIRD PROTECTION.

We also read, 'I hope that the several correspondents who wrote, last year, about cuckoos' eggs in dunnocks' nests, will not forget that I want a cuckoo's egg from such a nest. *Several* of them promised to look out for one this spring.' If the 'several' succeed surely the sacrifice of life will be tremendous? Besides, is not this inciting the several to break the law and put themselves within the clutches of the Yorkshire Wild Birds' and Eggs' Protection Committee? And with his characteristic lack of consistency the writer elsewhere draws attention to the good work of this particular committee, and appeals for funds to help it in its work.

NATURE AROUND HUDDERSFIELD.

In addition to the items already referred to, are many curious pieces of information under the heading of 'Nature around Huddersfield.' There is 'My Belief—I believe that nature is the work of God, and that as a wise worker He made a plan before He began,' etc. And, 'In the scarcity of *sensible songs* at the present day, I sometimes amuse myself by compiling *one for myself*. Here is one which might be sung to the tune called "Missionary," usually set to "Greenland's Icy Mountains."' We refrain from quoting this sensible 'song,' but the following four lines we consider to be the best:—

'You need but ask the lilies
And the birds up in the air,
They will tell you all their joy
Is to trust the Father's care.'

We then learn, 'thousands of my little paintings of birds have been almost given away, and persons have brought albums to fill. . . . Sunday next at home.' Thank heaven!

SCHOOL OF TROPICAL MEDICINE.

At a recent meeting of the Lancashire and Cheshire Entomological Society, Mr. Robert Newstead, M.Sc., F.R.S., Professor

of Entomology in the Liverpool University, welcomed the members to the School of Tropical Medicine, and gave a short account of its history and objects. The new buildings have only recently been entered, as during the war they were used as a military hospital. Full suites of rooms and laboratories are arranged for the requirements of each subject :—Tropical Medicine, Entomology and Parasitology, with a staff of professors and assistants highly qualified for the special work of the school. The building includes a museum and lecture theatre. The efficiency and completeness of the school was rendered possible by the foresight and liberality of the late Sir A. L. Jones, who fully recognised its value to the empire.

MELANISM IN LEPIDOPTERA.

We learn from *Nature* that 'melanism has long been a subject of special interest to British entomologists owing to the rise and spread of melanic varieties in many British species of moths and butterflies, such groups as the Geometridæ showing many examples.' Records of melanism go back at least to 1850, when the dark variety *Doubledayaria* of *Amphidasys betularia* appeared near Manchester. It afterwards spread until it became the prevalent or exclusive form in Lancashire and the Midland Counties, extending also to the Continent in later years. The earlier naturalists' point of view (as represented by the writings of Tutt and of Porritt) concerning its causation, related it to the progressive darkening of the background in the neighbourhood of cities as a result of industrialisation. When this explanation was found to be inadequate, moisture was added as a cause of melanism ; and Tutt concluded that moisture would darken the surfaces of rocks in rural districts just as smoke darkens surfaces in urban areas, natural selection progressively favouring darker forms which habitually rested on such darkened backgrounds.

A NEW THEORY.

In a recent consideration (*Journal of Genetics*, Vol. IX., No. 3) of melanism, based on extended observations and breeding experiments in Yorkshire, Mr. J. W. H. Harrison discards the older hypothesis and proposes a new one. This is based on a modification of the insect's metabolism by its feeding upon substances more or less impregnated with chemicals derived from the smoke. It is pointed out that certain melanic areas, such as the vicinity of Middlesbrough, Newcastle-upon-Tyne, and Moray Firth, are among the driest in the country, having a rainfall of 25-28 in. Also, in such species as *Boarmia repandata* and *Oporabia dilutata* the melanic varieties are confined to the towns, while the type occurs in the surrounding country. The melanic forms of different districts, moreover, differ from each other, showing that they have

originated locally and irrespective of each other. Observations showed that an increase in melanism was accompanied by a striking decadence of cryptogamic plants, especially mosses, liverworts, and lichens, many species having quite disappeared from affected areas owing to smoke contamination. This effect on vegetation, and also the degree of melanism, is found to diminish as one leaves the town.'

SCIENTIFIC PUBLICATIONS.

An 'editorial,' followed by correspondence, in recent issues of *Nature*, draws attention to the present serious state of things with regard to the publication of the work of scientific societies. It is truly pointed out that the present prices practically prohibit many societies publishing the results of their members' researches. Without publications much scientific information is lost to the world. To increase subscriptions, which seems to be the only way out of the difficulty at present, will certainly mean hardship to some of the members, and will probably prevent younger workers from joining the societies at all. As the scientific man, as a rule, does his work gratuitously, and, in fact, is often put to considerable expense in his researches, and in the publication of the results, it seems grossly unfair that he should also be called upon to pay additional subscriptions in order that his work may be given to the world. The only possible hope seems to be in the form of a Government Grant for work of this sort, but the usual reticence of the English Government in matters scientific does not give us much hope. However, the delegate for the Yorkshire Naturalists' Union has suggested this subject for discussion at the Conference of Delegates of the Corresponding Societies at the forthcoming meeting of the British Association at Cardiff, and possibly some good may arise from the discussion.

SOUTH EASTERN NATURALISTS.

The twenty-fifth Annual Congress of the South-Eastern Union of Scientific Societies was held at Eastbourne, from June 2nd-5th, and the present writer had the privilege of attending. The general secretary, Mr. H. Norman Gray, and the local Secretary, Miss D. M. Jay, had made every possible arrangement for the comfort and entertainment of the members The hospitality given to the delegates was on an elaborate scale ; most of those travelling any distance being guests of local residents. The Corporation lent the Town Hall for the meetings, Exhibition, Committees, etc., in addition to which the Mayor gave a reception on the Thursday evening, where the members had an opportunity of

examining an exhibition of specimens (including an unexpectedly fine series of 'faked' flint implements), and of meeting each other and enjoying 'light refreshments.' The usual songs and comic stories were given by a concert party. Sir Edward Brabrook delivered his presidential address, in which he wandered pretty freely over the domains of science, and ended up with a little political discourse.

PAPERS READ.

Among the papers read and discussed were the 'Glaciation of the South Downs,' by E. A. Martin (though, as the South Downs were never glaciated, the title seemed a little unfortunate); 'First Steps in a Local Survey,' by C. C. Fagg; 'The Eastward Extension of the Lusitanian Flora,' by Prof. Boulger; and the Migration of Lepidoptera, by R. Adkin. There were also reports of the Union's different Committees, and Prof. E. B. Poulton, F.R.S., gave a public discourse on Recent Discoveries in Insect Mimicry. The excursions were well arranged, and formed an important part of the programme; Old Eastbourne, Beachy Head, Pevensey Castle and Alfriston, East Dean and Friston being visited by motors. Unfortunately writers of local Guide Books had been selected to describe the places visited, and in their apparent anxiety to tell all they knew, no time was left to see anything. Another drawback seemed to be the difficulty of selecting any but about two or three speakers who talked on any and every occasion, sometimes at unnecessary length, when a little variety would have been welcome.

PRINTING.

An admirable programme was drawn up by the Union, in addition to which a similar one was issued by the Eastbourne Committee. In these circumstances the daily Bulletins, practically giving the same information, though in more words, seemed rather unnecessary in view of the present difficulties with regard to printing, etc. For instance, it was not very illuminating to learn that 'the President's address was of a most interesting nature, and was listened to with intense interest'; 'Last evening's reception by the Mayor and Mayoress at the Town Hall proved a brilliant success'; 'We hope to see again, at the Congress, some of the many distinguished men who have filled the chair in the interim, they will always have a warm welcome'; 'Members are warned to carry their tickets with them on the Rambles, as their production may be required on entry to some of the places visited.' The editor asked for notes suitable for publication in the Bulletin, but we think he might have 'blue-pencilled' such items as these.

"LU-LU."

(*Alauda arborea*).

Really, a Yorkshire songster? Yea, the woods
Of Rievaulx, Hackness, and Roche Abbey nigh,
And silvan launds, with melody it floods—
Our "Lu-Lu" with the buff blaze over eye!
Where maquis with wych'd woodland alternates,
Deep dells with crozier'd fern brakes' everglades
(Unlike the sky's lark dumb when light abates)
Air planing low, or perched, in serenades
All listening nature not by dark deterred,
With staves so various on a sole theme-Love,
That ear can scarce conceive 'tis but a bird
And not wing'd angel utterance from Above!

Blackcap and Whitethroat, Warbler of the Sedge:
Some mel of each 'stils loquent from its throat,
E'en that of passionate Bulbul some allege
And eke the Heaven-borne songster like a mote
Of sunlit music past poor vision's ken,
Tho' ever more sustained in lyric length,
Until there's nought of language left to men
Can wholly measure out its mansuete strength.
Contralto rather (yet with arcane spell)
Compared with that soprano of the Night.
The Daulian chanter—nut-brown Philomel,
The Woodlark gyves our Reason with Delight!

A joie de vivre the song, whate'er the hour—
Leaf-flustered dawn, or grey-eyed down-lashed eve—
Such as, rare laud-lark, some awakening flower
In sound its bliss at bloom-birth might upheave!
"*Lŭ-lŭ, lo-ēē-lu, lo louie, lu-lu*"
The rich impulsive chain song goes a-swing;
Sad but as love is sad that Hope ne'er knew,
Long as there's life perforce the throat must sing.
What else, then, not too recondite infer?
That Cosmos means all Ordered? Nay but more—
The choate joys, Form, Colour, Sound confer
Are Love's Receipts for teen, at Life its door.

May 16th, 1920. F. ARNOLD LEES.

PREHISTORIC ANIMAL?

We take the following from a newspaper dated June 13th:—'PREHISTORIC ANIMAL?—CREAM-COLOURED "MAMMOTH" WASHED ASHORE IN SCOTLAND.—Mystery surrounds the discovery of the remains of an animal washed ashore at

Craiguish, on the shore of Lorne, opposite the Island of Luing, in Argyllshire. One eye-witness describes it as being of the size of a horse with four very short, stout legs, the body being covered with cream-coloured fur about three inches long. One suggestion is that the carcase is that of a young mammoth buried under the sea bed during the Ice Age, and now uncovered by the action of the Atlantic waves.' We suppose it would be too much to expect our journalists to know a Polar Bear? Anyway, we are grateful that, for once, the ' mystery ' is not described as a Brontosaurus.

——: o :——

Black variety of Common Lizard.—On April 30th, 1920, I found one sunning itself near Southfleet, Kent, and had an excellent view of it as it remained still for about half-a-minute, its length being about four inches. I asked Mr. G. A. Boulenger of the British Museum if such were common ; and he replied ' they are known from England, but they are rare.' From what I remember of a black specimen of the Wall Lizard (*L. muralis*) from Florence, exhibited by him in 1905 (*P.Z.S.* II., p. 324), the above was very like it in depth of colour.—FREDERICK D. WELCH.

Horse Chesnuts Damaged by Frost.—A curious sight is to be seen in Harrogate. All the Chesnuts, of which there are quite a number, are in flower, but the leaves are all shrivelled by frost. In some cases the trees have the appearance of being in flower before the leaves have come. No other species of tree has apparently been affected, though, in some places on the outskirts, the bracken has been shrivelled up, and presents the appearance it usually does in late autumn. Oak trees, in some parts, are suffering from insect pests, but not to the extent they did last year.—R. FORTUNE, Harrogate, June 10th, 1920.

Andromeda polifolia near Halifax, Yorkshire.—In Lees' *Flora of West Yorkshire*, page 319, is recorded that *Andromeda polifolia* ' is a decreasing species, certainly gone from its Adel and Halifax stations, but only within the last 30 years.' While spending a holiday at Triangle, near Halifax, I enjoyed a ramble on the Soyland Moors above Lightazles, and paid a visit to the habitat of this rare small evergreen shrub. I first became familiar with this station for Marsh Andromeda in the late 'eighties, and I can truthfully say I never saw it so luxuriant and in such abundance, and the terminal tufts of pretty pink ' Bog bells ' so plentiful as they were this May. A considerable portion of the moorland flora in the swamp where it grows is made up of *Molinia, Eriophorum, Nardus, Narthecium*, etc.—JOE FIRTH, Liverpool.

A PECULIAR COLORATION.

FREDERICK D. WELCH, M.R.C.S.

At the end of the Family *Ursidae*, there is a very curious genus *Ailuropoda** (which differs from the true Bears of the Family in the large size of its premolar and molar teeth, in the palate *not* being prolonged behind the last molar teeth, and in the general shape of the skull), with only one species *A. melanoleuca*. It has been called the Parti-coloured Bear ; but on account of the facts just mentioned, the name of Great Panda is better.

In outward shape it is bear-like, with the head large in proportion to body, and stands about 27 inches at the shoulder (estimated height of mounted specimen) with the total length from tip of nose to its very short stumpy tail 5 feet in the adult skin after-mentioned ; the soles of the feet were hairy in this specimen. Unlike the majority of true Bears, it is an exceedingly rare mammal, originally discovered in 1869 by Père David in the most inaccessible mountains of Eastern Tibet, and the skin and skull, from which the following measurements were taken, were from a specimen killed near the Upper Min River, Won Chuen, Sze-chwan, West China.

When the late R. Lydekker wrote about the true Bear *Ursus pruinosus*,† he made some remarks about *Ailuropoda*, stating ' of what advantage to its owner may be the peculiar coloration . . . . has *never* been determined '' (*See Proc. Zool. Soc.*, 1897, p. 415—italics are mine). I believe these words to have remained true until this paper was forwarded to *The Naturalist*, and I therefore claim the opinion expressed later on as an original one.

As I have heard visitors to the British Museum make very erroneous remarks about the mounted specimen, calling it ' an albino ' and such like, it is necessary to lay stress on the fact that the coloration is *normal* ; and the plan of marking was *constant* in all three specimens seen by me (two in the Museum, one in Messrs. Rowland Ward's premises in the year 1909).

---

* This name will be seen to *differ* from that in some books (Mammals, Living and Extinct,' *Royal Natural History*), where the genus is called ' Aeluropus,' but has been used because Mr. O. Thomas informs me it is the *correct* one, and it was also on the Sze-chwan skin and skull labels in the Museum.

† I *cannot* agree with the remarks on the coloration of the Museum skin which is *not* black and white (line 13, p. 414. *Proc. Zool. Soc.*, 1897,) as stated by that writer, but *grey* and white ; and is also unlike that of any other member in the Family ; *also* I *cannot* agree with the remarks in lines 6, 7, 8, on page 415, about ' curious approximation ' —all made by Lydekker.

1920 July 1

In the Great Panda the following parts are Jet black, a patch round each eye about 2.75 inches in diameter, the ears, the hind legs, fore legs, and a connecting band over the shoulder which band measures about three inches in breadth at its narrowest part, which is in the median line of the back. The rest is pure white, the black and white patches having well-defined edges, and *not* merging into each other. It is, therefore, very different from the coloration and plan of mark of *Ursus pruinosus* and also of any other large or medium-sized carnivorous mammal, whether in Asia or other part of the world. Why is this one mammal so very different?

Examination of the Sze-chwan specimens has resulted in my forming the opinion that the Great Panda is an example of Warning Coloration. These last two words mean a coloration which shows up a mammal, making it conspicuous to its enemy mammals, and therefore warns them *not* to interfere with its owner. The owners of such colorations are well provided with means for self-defence, in proportion to their size.

These mammals are prevented from becoming too numerous by being also conspicuous to their human enemies; besides, there can be little doubt that a certain proportion of specimens in each species become killed each year by the bites of poisonous snakes, on to which they happen accidentally to tread.

The Great Panda is quite able to defend itself against the average enemy mammal, because the legs appear strongly built, and have strong, curved claws capable of inflicting a severe wound; while, on the other hand, the thick longish hair would break the force of blows aimed at its body, hindering the claws of an enemy mammal from penetrating the thick, leathery hide.

But the chief strength for defensive purposes clearly lies in the powerful massive skull, which is 25·5 centimetres in basal length, and 20·5 in breadth across the zygomatic arches (in the Sze-chwan specimen). The brain is additionally protected from injury in a fight by a very strong, large bony crest along the upper surface of the brain case. In the lower jaw, the ascending ramus and coronoid process are large and well developed,* giving great space for attachment of the muscles used in biting, and everything points to these being exceedingly powerful. The teeth also are very formidable, those in the upper jaw measuring, 1st molar, 2·5 long by 2·7 broad, 2nd molar 3·6 long by 2·7 broad; in the lower jaw, 4th premolar 3·2 long by 2 broad, 1st molar 2·7 long by 2·2 broad, 2nd molar 2 long by 2 broad — all measured in centimetres.

* When standing flat on a table, the top of the process reaches to a height of about 13 centimetres from the surface of the table.

The whole is massive and weighty, the Sze-chwan specimen complete with lower jaw, weighing 3lbs. 7·5 ozs. ; whereas, for comparison, it may be pointed out that the *Ursus pruinosus* skull, measuring 27·5 long by 15 broad, both in centimetres, and from the same points, weighs 2 lb. 2·5 ozs. (this latter skull is *fully adult*, as shown by the sutures at the back of the brain case being in process of closing, and not ' sub-adult,' as stated in (l. 6, p. 414, 1897, *Proc. Zool. Soc.*).

From the former account, it is obvious that the Great Panda is a very powerful mammal for its size ; and when the teeth with their large grinding crowns are considered and the formidable lower jaw, it clearly could give the leg of a Leopard, Lynx, or Himalayan Black Bear a very severe and unpleasant crushing, if it got such well between its premolar and molar teeth ! Probably such crushing, if only for a few seconds, would render that limb useless for the rest of the fight !

When we look at the peculiar colorations and plan of marking in the Great Panda, *unique* among large mammals, there is good reason for thinking that another carnivorous mammal which had *once engaged in an unsuccessful fight would easily recognise it again*, and *not* engage in a second fight ! A Tiger is, in my opinion, the *only* mammal capable of fracturing the massive skull ; but so far as I can discover, it does not inhabit the same districts permanently.

The Great Panda is an exceedingly rare mammal, the habits of which are not so well known as most of the Family, but the fact that its food is vegetarian only, so far as known, is in favour of the Warning Coloration opinion—the warning being no hindrance to its obtaining sufficient nourishment.

——: o :——

The *Report of the Marlborough College Natural History Society*, No. 68, contains in a compact form an enormous amount of valuable information relating to the various ' ologies ' of the different sections of this Society. In addition to the usual branches of Natural History, are Astronomy, Bryology, Lichenology, Malacology, Meteorology, as well as an elaborate Anthropometrical report. Oddly enough Geology and Geography do not seem to be dealt with.

No. 1 of *Time and Tide*, dated May 14th, has been sent to us for review. It contains 24 pages, and is sold at 4d. We do not see that it appeals to us very much, but as it is entirely ' run ' by women, the respect to the sex necessitates a reference being made to the publication, which is apparently a weekly Journal. We have shown the publication to two or three women, who report there is nothing particularly interesting to women in it, and that ' it might be anybody's paper.' As we had recently seen the play, we read, with interest, one article dealing with Sir James Barrie's new play, ' Mary Rose.' The criticism is by Miss Rebecca West, and it is evident that she has not grasped the beauties of the play at all. Her review certainly gives one the impression that she did not receive at the theatre the respect that she thought was due to her position as a critic. Or is she courting publicity by adopting Shavian tactics ?

YORKSHIRE BOTANISTS AT HUDDERSFIELD.

THE Botanical Section of the Yorkshire Naturalists' Union made an excursion to the Huddersfield district on Saturday, May 15th, to inspect the Deerhill and Wessenden Moors, under the guidance of Dr. T. W. Woodhead. A party of about twenty-five met at Meltham and proceeded to Deerhill reservoir, where Dr. Woodhead explained the nature of the peat there disclosed, with its remnants of Birch and Pine which once afforested this part of the moors. Climbing the hillside known as ' Chain ' to the Boundary Rock quarry, and then to the tableland, a great area of water-logged peat was encountered, the dull russet of the Cotton grass being interspersed by the yellowish tones of Moor Grass ; Bilberry, Cloudberry, Crowberry and Ling were noted as indicating varying conditions in the underlying peat. Excellent evidence of the depth of the peat—varying from three to fifteen feet—was obtained along the boundary grips, and where cutting for fuel had taken place. Emerging into Wessenden by way of Ram's Clough, opportunity was afforded during the walk to the summit, to notice the variable depth and constituents of the Eriophorum and Calluna peat beds disclosed.

After tea, at the ' Isle of Skye ' Inn, the return journey to Meltham was made by Royd Edge Moor, where a Calluna association was very pronounced, and where peat sections five feet in thickness were examined.

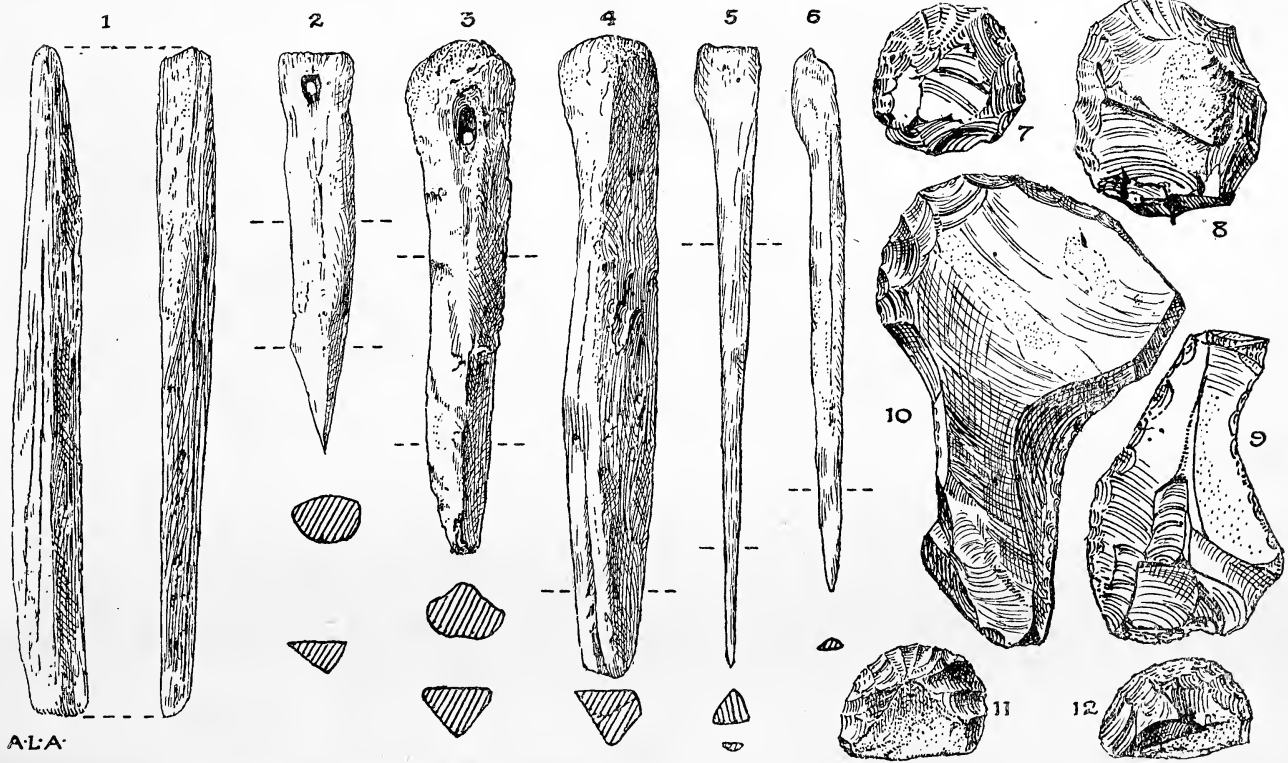
In the absence of bloom at this early season of the year, special attention was given to mosses characteristic of moorland areas, and many of the common species were seen. Shooters Nab will long be remembered by those who stopped at the 'cave ' and saw the crumbling sandstone walls aglow with the golden iridescence of the ' cavern moss ' or ' luminous moss ' (*Schistostega*). This ' cave ' afforded a good example of a plant association peculiar to such places, the predominant species having either a persistent protonema weaving a fine web over the friable surface, or bearing hosts of vegetative reproductive bodies in the form of gemmæ ; as the rock face weathers away, repeatedly exposing a fresh yellow surface, it is the plant provided at all seasons with detachable germ cells or a vigorous protonema, that colonises the new area ; in this instance *Tetraphis pellucida, Polytrichum aloides, Schistostega osmundoides, Webera annotina* and *Calypogeia trichomanis* were conspicuous. *Brachyodus trichodes* was also seen in nice condition.

Another feature of interest was the deposition of ochre in Wessenden ; in places it assumed the form of a layer an inch thick between the rubbly shale and finer clay below the peat ; it tinged the rock over which drainage trickled, and in one place was seen to give its colour to a long water channel ; information as to the cause of this deposit, whether chemical or biological, and its possible connection with moor pan formation would add to the general understanding of moorland problems.

On the return journey our guide had his pocket burdened and his thoughts enlivened by a block of black flint some four inches in diameter, bearing its original grey crust, a relic of a long forgotten people who perhaps knew these moors as forest covered hills and valleys. It was an excellent specimen of the raw material as brought from the wolds, from which neolithic man fashioned his flint knives and weapons ; found in Great Clough Dyke in 1906, it has lain in the gamekeeper's house until, in the fulness of time, the fates have ordained that it should be deposited in the Museum at Huddersfield, where it will be placed side by side with rough flakes and highly finished implements fabricated from similar blocks of imported stone.—W. H. BURRELL.

—:o:—

The Report of the Castle Museum Committee, Norwich, 1919 (21 pp.), contains valuable records of the excellent work accomplished by this well known institution.



Implements of Bone and Flint from Bradfield, Yorks. $\frac{1}{1}$.

PREHISTORIC IMPLEMENTS OF BONE AND FLINT FROM BRADFIELD, S. YORKS.

A. LESLIE ARMSTRONG, M.C., F.S.A. (SCOT.).

PLATE II.

THE collection of Mr. W. F. Jackson, of Broad Storth, Dore, includes an interesting series of six bone implements picked up by him on a ploughed field at Rocher Head, Bradfield, near Sheffield, in 1888. In the same field were found a number of well worked implements of flint, consisting of round and horse-shoe scrapers, a "spoon' scraper and several trimmed flakes and knives. By the courtesy of Mr. Jackson I am permitted to illustrate and describe these.

The bone implements have been examined recently by Mr. Reginald Smith, of the British Museum, who considers them to be of late Neolithic or early Bronze Age date. Probably some of the associated flint implements are of the same period, others are earlier and more definitely Neolithic. Sir William Boyd Dawkins has also examined them, concurs in the opinion as to date, and identifies the bones as follows:—Fig. 1, a portion of a mammalian long bone, but its exact description not determinable. Fig. 2, portion of a small metatarsal bone of horse. Figs. 3 and 4, the inner and outer small metatarsal bones of horse. Fig. 5, a splinter, and not exactly determinable. Fig. 6, probably bird.

Fig 1 appears to have been rubbed down to form a blade on one long edge for about half its length, and may have been utilised in the dressing of skins. Fig. 2 has been rubbed down to a fine point. The rubbed portion is triangular in section, and an oblique cutting edge of 15 mm. is formed on one side of it. Figs. 2 and 3 have been perforated at the thickest end, the perforation having been very neatly drilled from alternate sides to meet in the centre. Fig. 3 has apparently been a similar form of implement to Fig. 2, but the point has been considerably damaged, and its exact form is not now evident. There is distinct evidence of rubbing for 28 mm. from the point upwards on the right hand side, as illustrated. Fig. 4 has been rubbed to an edge on one side of the lower third of its length and to a triangular section. The point is broken, and the bone considerably cracked as a result of drying. Figs. 5 and 6 are obviously piercers, and both show evidences of rubbing and smoothing at the point. All the implements are well preserved. They were found at various times upon the surface after ploughing operations and within a restricted area. It is probable that they were originally deposited within a tumulus of which agricultural operations have demolished all traces, or they may represent a hoard.

1920 July 1

The flint implements are such as are usually found upon sites situated upon the moorland foothills at this altitude (about 1000 O.D.) in the vicinity of Bradfield.

The scrapers are neatly worked and show the usual steep faced fluted chipping, but are all of small size. Figs. 7, 8, 11 and 12 are characteristic types; figs. 11 and 12 being the half round and Figs. 7 and 8 the usual round variety. All are worked on one face only, viz., that illustrated; the reverse being the plain bulbar face of the flake. The bulb and the percussion platform, where not removed in trimming, is, in each case, on the bottom edge as drawn. Figs. 11 and 12 are outer flakes and have a portion of the crust on the upper face. Fig. 8 is a creamy white flint with a coarse cherty texture, the remainder are of brown or black flint, of fine quality and highly lustred.

Figs. 9 and 10 are of much rougher workmanship than the scrapers, more boldly chipped, and suggest a different culture, and may be coeval with the bone implements. Fig. 10 is an example of the spoon-shaped scraper similar, though of inferior workmanship, to Fig. 221 in the late Sir John Evans' 'Ancient Stone Implements,' second edition, a variety which is not common in Yorkshire, and occurs most frequently in the East Riding. This is the first example I have seen from South Yorks. Fig. 9 is a trimmed flake knife bearing obvious signs of use on all its edges. Both these implements are of grey chalcedonic flint, and worked on one face only.

Fig. 10 is unusually large for a South Yorkshire implement, one of the characteristics of which is their small size, due to the scarcity of raw material. There is no native flint nearer than the Chalk Formations of the Wolds, in East Yorks. (which is unsuited for making implements), neither does flint occur locally in the drift deposits, therefore every scrap of flint has been imported or traded into the locality, most probably from the East Riding. Every fragment found, however small, appears to have been utilised, and evidences of man's handiwork or interference can confidently be anticipated upon it.

——: o :——

Keys to the Orders of Insects, by **Frank Balfour-Browne.** Cambridge: at the University Press, 58 pp., interleaved, 7/6 net. This work consists of keys to the twenty recognised orders of insects, and of keys to the families in the Orthoptera, Rhynchota, Lepidoptera, Coleoptera, Diptera and Hymenoptera. They were originally drawn up for students of Applied Entomology, and as the keys themselves have been modified as a result of practical working, they should prove of considerable use to the general entomologist. Diagrams illustrating the wing venation of the Diptera, Hymenoptera, etc., increase the usefulness of the book.

ADDITIONS TO YORKSHIRE DIPTERA.

JOHN H. ASHWORTH AND C. A. CHEETHAM.

As interest in the two-winged flies is spreading to other parts of Yorkshire, the time seems opportune for publishing particulars of additions to the Yorkshire Lists, which have been found mainly in the area worked by the Bradford Natural History Society. The foundation county list was compiled by Mr. P. H. Grimshaw, and appeared in the *Victoria History of the County of York*. This was supplemented by an additional list, which appeared in *The Naturalist*, March 1908, and by articles in *The Bradford Scientific Journal*. Since then, thanks to the courtesy of Prof. Garstang, and the authorities in connexion with the Leeds University Museum, we have been permitted to examine the collection formed by the late Dr. Meade of Bradford, and find that many of his Yorkshire captures have not been recorded, the remarks in his descriptions of species in *The Entomologist's Monthly Magazine* being largely confined to generalities of occurrence as 'rare,' 'not uncommon,' without indication of the locality where taken. The names of some of his species do not seem to have been included in Verrall's later list of Diptera; difficulties of synonomy may account for the apparent absence of some of them, so we think it best for the present to give the particulars of local captures corresponding to his descriptions, leaving other points to be dealt with in a full Monograph of Yorkshire Diptera, which it seems desirable should be published in the future; even now it would rank worthily with Wingate's Durham Diptera, or Cooke's list for Lancashire and Cheshire.

The nomenclature followed is that of Verrall's second list (December, 1901—species not shown therein being indicated by an asterisk).* This was followed mainly by Rev. W. J. Wingate, in his Durham Diptera (Vol. II., *Transactions of Nat. Hist. Soc. of Northumberland, Durham, etc.*),* the only general work in English to which a student can have ready access. In it, Wingate only just touches upon the Family Mycetophilidæ and leaves Pulicidæ and Cecidomyidæ alone. These families have been revised recently and the lists of Verrall are practically out of date. As little work has been done in this county, it is proposed to leave them out for the present. Two other families—Chironomidæ and Tachinidæ—are in a very difficult, if not hopeless, state. In respect to the former, Verrall rejected Walker's names, but dying before the projected third volume of 'British Flies' was

* See also *The Naturalist*, 1903, p. 269 *et seq.*

published, has practically put nothing in their place, and if Walker's list be not accepted, others will have to be provided in many cases. Van der Wulp, who died about 1900, had done good work with the Chironomidæ, but unfortunately he ignored much of Walker's work. The Genera Insectorum now being issued has, however, included Walker's names.

For the present, responsibility for the identifications in this family must remain with the person capturing the specimens, Wingate's Tables being closely adhered to. In the remaining families, earlier captures were verified by the Rev. W. J. Wingate, some few, however, being submitted with later captures to Mr. Percy H. Grimshaw, to whom we are much indebted, as also for his offer to provide a type collection, which may enable us to clear up many questionable species even now in hand.

Initials in the ensuing list, besides our own and Dr. Meade's (R.H.M.), refer to several members of the Bradford Society as follows :—

J.B. (J. Beanland) R.B. (Rosse Butterfield)
J.W.C. (J. W. Carter) F.R. (F. Rhodes)
T.S. (T. Stringer)
Sand. Coll. (Sanderson Collection deposited in the Cartwright Museum, at Bradford).

BIBIONIDÆ.

Scatopse pulicaria Lw. Thackley, 5/5/05, J.H.A.
Bibio leucopterus Mg. Addingham, 5/6/09, J.H.A.; Malham, –/6/10, J.W.C.
B. venosus Mg. Oakworth, 26/5/12, T.S.
B. varipes Mg. Clapham, 21/5/05, J.W.C.; Malham, –/6/09, J.W.C.
B. clavipes Mg. Austwick, –/10/18, C.A.C.; Malham, –/6/19, J.W.C.

CHIRONOMIDÆ.

Chironomus plumosus L. Ilkley, 3/5/06, J.H.A.; Farnley, –/8/18, C.A.C.
C. aprilinus Mg. Bradford, –/8/16, F.R.; Otley, 30/7/10, J.H.A.
C. brevitibialis Ztt. Ilkley, 28/5/10, 9/6/14, J.H.A.
C. pictulus Mg. Ilkley, 10/5/12, Clapham, –/5/05, Newsholme, 11/6/14, J.H.A.
C. nubeculosus Mg. Ilkley, 28/5/10, J.H.A.
Crictopus annulipes Mg. Ilkley, 3/5/10, J.H.A.
C. sylvestris F. Denton, 22/5/10, J.H.A.
C. tremulus L. Ilkley, 7/5/09, J.H.A.
Orthocladius testaceus Mcq. Ilkley, J.H.A.
O. melaleucus Mg. Ilkley, J.H.A.
O. stercorarius Deg. Common (Ilkley, Farnley, Austwick).
Tanytarsus tenuis Mg. Ilkley, 22/5/10, Gill Rock, 10/6/14, J.H.A.
T. pusio Mg. Bolton Abbey, 31/5/06, Ilkley, 5/9/06, J.H.A.
Metriocnemus fuscipes Mg. Pool, 27/3/09, Ilkley, 8/5/10, J.H.A.; Farnley, –/4/19, Austwick, 2/7/19, C.A.C.
Diamesa obscurimanus Mg. Denton, 20/6/09, Ilkley, 3/5/10, J.H.A.
Tanypus varius F. Baildon, 12/5/05, Ilkley, 3/5/10, J.H.A.; Farnley, –/8/18, C.A.C.

Tanypus punctipennis Mg. Gill Rock, 10/6/14, J.H.A.; Farnley, –/8/18, C.A.C.
T. plumipes Fries. Ilkley, 21/3/09, J.H.A.
T. melanops Mg. Denton, 15/5/09, Ilkley, 27/5/09, J.H.A.; Farnley, 3/9/18, C.A.C.
T. nebulosus Mg. Common (Ilkley, Farnley and Austwick).
T. choreus Mg. Otley, 19/6/08, Gill Rock, 10/6/14, Newsholme, 11/6/14, J.H.A.

CULICIDÆ.

Culex cantans Mg. Ilkley, 23/5/08, J.H.A.

PTYCHOPTERIDÆ.

Ptychoptera contaminata L. Denton, 22/5/10, Huby, 25/6/07, Weeton, 7/6/10, J.H.A.
P. scutellaris Mg. Bingley, –/6/18, F.R.; Bolton Woods, 31/5/06, J.H.A.

LIMNOBIDÆ.

Limnobia trivittata Schum. Norber Syke, 29/5/05, Ilkley, 7/7/06, J.H.A.; Cottingley Bridge, –/7/18, F.R.
Dicranomyia stigmatica Mg. Ilkley, 4/6/06, Clint (nr. Harrogate), 1/6/06, J.H.A.
Rhypholophus similis Stæg. Cited as in Yorks. area at Deepdale, N. Riding, by W. J. Wingate.
Ephelia marmorata Mg. Denton, 20/6/09, Stainburn, 26/6/09, J.H.A.; Newsholme, 19/7/18, R.B.; Austwick, –/6/19, C.A.C.
E. apicata Lw. Some of the specimens from Stainburn seem to work out to this species.
Pœcilostola punctata Schrk. Keighley to Silsden, 6/5/05, Denton, 27/5/10, Ilkley, 28/5/12, J.H.A.; Austwick, 18/5/19, C.A.C.
Epiphragma picta F. Malham, –/6/10, J.W.C.
Limnophila lineola Mg. Addingham, 26/6/08, J.H.A.
Amalopis immaculata Mg. Bolton Woods, 31/5/06, Denton, 10/5/10, J.H.A.

TIPULIDÆ.

Pachyrrhina analis Schum. Ilkley, 19/7/07, J.H.A.
Tipula longicornis Schum. Burley, 5/7/10, J.H.A.
T. hortulana Mg. Weston, 9/6/06, Burley, 2/6/09, Bramhope, 3/6/10, J.H.A.
T. lunata L. Newsholme, 11/6/14, J.H.A.; Austwick, 12/7/19, C.A.C.
T. vittata Mg. Arthington, 18/5/09, Austwick, 22/5/05, J.H.A.

LEPTIDÆ.

Leptis nigriventris Lw. Askwith, 15/7/09, J.H.A.; Austwick, –/7/18, C.A.C.

ASILIDÆ.

Neoitamus cyanurus Lw. Keighley, 1911, R.B.

SCENOPINIDÆ.

Scenopinus fenestralis L. Bradford, 1888, R.H.M.

EMPIDÆ.

Rhamphomyia dentipes Ztt. Bingley, 1880, R.H.M.
Empis punctata Mg. Hornsea, –/6/1889, R.H.M.
Hilara manicata Mg. Bradford, –/7/1894, R.H.M.
H. litorea Fln. Bradford, 24/7/1887, R.H.M.
**H. pruinosa* Mg. Manningham, 3/5/1886, R.H.M.
Clinocera (*Heleodromia*) *fontinalis* Hal. Morton 29/9/10, J.H.A.

Hemerodromia melanocephala Hal. Ilkley, 9/6/14, J.H.A.
H. stigmatica Sch. Ilkley, 9/6/14, J.H.A.
Tachydromia (*Platypalpus*) *pallipes* Fln. Manningham, 27/5/1884, R.H.M.
T. agilis Mg. York, Bradford, 1878, R.H.M.; Gill Rock, 10/6/14, J.H.A.
T. exigua Mg. (*femoralis*) Ztt. Manningham, 31/5/1897, R.H.M.
**T. unguiculatus* Ztt. Bradford, R.H.M.
T. maculipes Mg. Bradford, 21/5/1893, R.H.M.
T. flavipes F. Manningham, R.H.M.

DOLICHOPODIDÆ.

Dolichopus confusus Ztt. Horton, 1879, R.H.M.
D. simplex Mg. (*thalassinus*) Hal. Horton, 1880, R.H.M.
Xiphandrium caliginosum Mg. Nab Wood, 1880, R.H.M.
Xanthochlorus tenellus W. Bolton Abbey, 25/6/09, J.H.A.

SYRPHIDÆ.

Pipizella Heringi Ztt. Saltaire, –/7/17, Sands. Coll.
Chrysogaster solstitialis Fln. Dob Park, 28/8/10, J.H.A.
Chilosia scutellata Fln. Gormire and Washburn, –/8/19, C.A.C.
C. variabilis Pz. Nab Wood, 14/7/15, F.R.; Ilkley, 28/5/12, J.H.A.; Ling Gill, 15/6/19, C.A.C.
C. illustrata Harr. Bridlington, –/7/19, F.R.
Pyrophæna rosarum F. Ripon, 1910, Haigh Lumby.
Ischyrosyrphus laternarius Müll. Woodhall Hills, 15/8/16, Burley, 14/7/10, J.H.A.; Adel, 30/8/19, C.A.C.
Syrphus albostriatus Fln. Thornbury, 11/9/05, J.H.A.; Farnley, 2/8/19, C.A.C.; Apperley and Saltaire, –/8/17; Sands. Coll.
S. venustus Mg. Black Hills, –/6/16, J.W.C.; Grassington, 19/8/15, Deffer Wood, 17/5/12, R.B.; Austwick, 24/5/19, C.A.C.; Harrogate, 2/6/19, J.H.A.
Helophilus trivittatus F. Apperley, –/8/17, Sands. Coll.; Keighley, –/–/18, R.B.
Merodon equestris F.
var. *equestris* F.
var. *narcissi* F. } Bradford, –/3/13, J.B.
var. *validus* Mg.
Criorrhina ranunculi Pz. (*ruficauda* Mg.). Hovingham, (Inchbald), Meade's Coll.
C. berberina F. Grassington, 11/6/11, Barden, 21/6/19, R.B.

CONOPIDÆ.

Sicus ferrugineus L. Hirstwood, F.R., May/June, 1919.

TACHINIDÆ.

**Tachina morosa* Mg. Apperley, 1875, Heaton, 1876, R.H.M.
Thelaira leucozona Pz. Thorparch, 1879, R.H.M.
Plagia ruralis Fln. York, 1880, R.H.M.
Thryptocera crassicornis Mg. Bradford, 1873, R.H.M.
Sarcophaga similis Meade. Apperley, 1878, R.H.M.
S. agricola Mg. Rawdon, 1874, R.H.M.
S. laticornis Mg. Bingley, 1878, R.H.M.
S. melanura Mg. Wakefield, 1876, R.H.M.
Dexiosoma (*Prosena*) *canina* F. Thorparch, 1879, R.H.M.
Prosena sybarita F. Shipley Glen, R.H.M.

MUSCIDÆ.

Hæmatobia stimulans Mg. Clapham, 13/5/05, Ilkley, –/9/08, J.H.A.

Cyrtoneura pabulorum Fln. York, 1880, Bolton Bridge, 1875, R.H.M.
C. cæsia Mg. York, 1880, R.H.M.
Pyrellia lasiophthalma Mcq. Bolton Bridge, 1875, R.H.M.
P. serena Mg. Malham, 25/5/15, J.H.A.
**P. ænea* Ztt. Selby, –/–/17, R.B.

ANTHOMYIDÆ.

Hyetodesia serva Mg. Heaton, 1877, R.H.M.
H. umbratica Mg. Heaton, 1878, Manningham, 1880, R.H.M.
**H. trigonalis* Mg. Apperley, 1875.
H. basalis, Ztt. Harden (Bingley), 1873, R.H.M.
H. rufipalpis Mcq. Nab Wood, 1873, R.H.M.
H. pallida F. Apperley, 1873, R.H.M.
Allœostylus flaveola Fln. Bow Beck, 27/8/07, Ilkley, 11/7/08, J.H.A.; Sunnydale, –/7/15, J.W.C.
Mydæa vespertina Fln. Nab Wood and Ilkley, 1880, R.H.M.
M. urbana Mg. Nab Wood, 1874, R.H.M.
M. separata Mg. Clapham, 1878, R.H.M.
Spilogaster maculosa Mg. Apperley, 1873, R.H.M.
S. quadrimaculata Fln. Bradford and Ilkley, 1874, R.H.M.
S. quadrum F. Buck Mill, 12/8/05, J.H.A.
S. flagripes Rnd. Ilkley, 1874, R.H.M.
S. depuncta Fln. Nab Wood, 1877, R.H.M.; Clapham, 16/7/05, J.H.A.
S. consimilis Fln. Nab Wood, 1874, R.H.M.
Melanochila riparia Fln. Ilkley, 1874, R.H.M.; Malham, –/–/18, J.W.C.
Hydrotæa armipes F. Thorparch, 1899, R.H.M.
Ophyra leucostoma W. Shipley, 1873, R.H.M.; Ilkley, 11/10/08, J.H.A.
Trichopticus cunctans Mg. Baildon, Rawdon, 1874, R.H.M..
T. pulcher Meade. Bolton Bridge, 1880, R.H.M.; Gill Rock, 10/6/14, J.H.A.
Hydrophoria ambigua Fln. Strensall, 1880, R.H.M.
H. linogrisea Mg. Ilkley, 6/8/09, J.H.A.
H. anthomyiea Rnd. Nab Wood, 1880, R.H.M.; Arthington, 18/5/09, J.H.A.
H. socia Fln. Rawdon, 1874, R.H.M.
Hylemyia lasciva Ztt. Apperley, 1875, R.H.M.
H. pullula Ztt. Apperley, 1875, R.H.M.
Chortophila striolata Fln. Bolton Bridge, 1875, R.H.M.
C. trapezina Ztt. Queensbury, 1881, R.H.M.
C. sepia Mg. Heaton, 1877, R.H.M.; Ilkley, 18/5/06, J.H.A.
Phorbia pudica Rnd. Horton, 1879, R.H.M.
P. cilicrura Rnd. Apperley, 1875, R.H.M.
P. trichodactyla Rnd. Apperley, 1875, Bradford, 1879, R.H.M.
P. florilega Ztt. Heaton, 1875, R.H.M.
P. neglecta Meade. Apperley, 1880, R.H.M.
Pegomyia nigritarsis Ztt. Idle, 1875, R.H.M.
P. exilis Mg. Bingley, R.H.M.
P. versicolor Mg. Horton, 1879, R.H.M.
**P. setaria* Mg. (Wdm.). Thorparch, 1879, R.H.M.
Homalomyia (*Fannia*) *hamata* Mcq. Heaton, 1873, R.H.M.
H. fuscula Fln. Apperley, 1878, R.H.M.
H. aërea Ztt. Apperley, 1876, R.H.M.; Gill Rock, 10/6/14, J.H.A.
H. coracina Lw. Shipley, 1882, R.H.M.
H. sociella Ztt. Apperley, Bradford, 1874, R.H.M.
H. serena, Fln. Apperley, 1876, R.H.M.
H. incisurata Ztt. Apperley, Manningham, 1884, R.H.M.
H. mutica Ztt. Idle, 1875, R.H.M.
Azelia Zetterstedti Rnd. Horton, Apperley, 1875, R.H.M.
A. cilipes Hal. Frizinghall, Manningham, R.H.M.; Wingate at Deepdale.

Caricea tigrina F. Apperley, 1875, R.H.M.
**C. ciliato-costa* Ztt. Nab Wood, 1875, R.H.M.
Cœnosia triangula Fln. (*nigripes*) Rnd. Heaton, 1882, R.H.M.; Damaged specimen.
C. genualis Rnd. Manningham, 1886, R.H.M.
Hoplogaster mollicula Fln. Thorparch, 1879, R.H.M.

CORDYLURIDÆ.

Norellia liturata Mg. Yorks. from Porritt (Meade Coll.).
N. flavicauda Mg. Apperley, 4/6/84, R.H.M. (Meade has separated this from *N. spinimana*).
Scatophaga analis Mg. Apperley, 1880, R.H.M.

HELOMYZIDÆ.

Helomyza ustulata Mg. Ilkley, 21/9/10, J.H.A.
H. pallida Fln. Farnley, 1918, C.A.C.
H. lævifrons Lw. Bingley, –/8/18, F.R.; Austwick, 12/7/19, Adel, 20/8/19, C.A.C.
**Tephrochlamys magnicornis* Lw. Bradford, 1879, R.H.M. (? *Heteromyza*. Meade has separated it from *H. oculata*).
Allophyla atricornis Lw. Middleton (Leeds), –/9/18, C.A.C.
Œcothea fenestralis Fln. Bradford, R.H.M.

SCIOMYZIDÆ.

Sciomyza Schœnherri Fln. York, 1890, R.H.M.; Adel, 4/9/19, C.A.C.
Tetanocera elata F. Austwick, 28/6/19, Bubwith, 25/6/19, Gormire, 7/8/19, C.A.C.
T. lævifrons Lw. Austwick, 12/7/19, Adel, 30/8/19, C.A.C.
T. ferruginea Fln. Austwick, 22/8/19, Bubwith, 25/6/19, C.A.C.; Bolton Bridge, 1885, R.H.M.
T. robusta Lw. Austwick, 28/6/19, Bubwith, 25/6/19, C.A.C.; Nab Wood, 1880, R.H.M.
Limnia marginata F. Flambro', 5/8/19, F.R.
Elgiva rufa Pz. York, 1880, R.H.M.
E. lineata Fln. Pilmoor, 9/8/19, C.A.C.

PSILIDÆ.

Psila pallida Fln. Ilkley, 1874, Bradford, 1889, R.H.M.
P. nigra Fln. Bradford, 1877, R.H.M. Damaged Specimen.

TRYPETIDÆ.

Platyparea discoidea F. Addingham Moorside, 28/5/12, J.H.A.
Trypeta cylindrica (*onotrophes*) Des. Austwick, 28/6/19, C.A.C.
T. florescentiæ L. Bubwith, 25/6/19, C.A.C.
Tephritis miliaria Schrk. Bubwith, 25/6/19, C.A.C.
T. vespertina Lw. Austwick, 22/8/19, C.A.C.

LONCHÆIDÆ.

Lonchæa chorea F. Stainburn, 24/9/10, J.H.A.; Manningham, 1879, R.H.M.
Palloptera arcuata† Fln. Malham, Saltaire, B.Sc.J., Austwick, –/6/19, Farnley, 2/6/19, C.A.C.
P. trimacula† Mg. Adel, 4/9/19, C.A.C.

† Grimshaw says these two species have been confused in Wingate's and other lists, hence the entry in *Bradford Scient. Jour.*, Vol. III., No. 1, p. 23, is wrong, and the records should stand as above.

SAPROMYZIDÆ.

Sapromyza apicalis Lw. Bradford, 1883, R.H.M.
**S. sexpunctata* Mg. Bingley, 1881, R.H.M.
Lauxania ænea Fln. Woodhall, 4/9/05, J.H.A.; Farnley, –/7/18, C.A.C.

OPOMYZIDÆ.

Balioptera tripunctata Fln. Ilkley, 22/9/10, J.H.A.
B. combinata L. Bradford, 1877, R.H.M.

SEPSIDÆ.

Themira putris L. Bradford, 1879, R.H.M.

PIOPHILIDÆ.

Piophila casei L. Nab Wood, 1881, R.H.M.
P. affinis Mg. Bradford, 1884, R.H.M.

DROSOPHILIDÆ.

Drosophila fenestrarum Fln. Bradford, 1888, R.H.M.

CHLOROPIDÆ.

**Chlorops minuta* Lw. (*hypostigma* Ztt.?). Bradford, 1885, R.H.M.

PHYTOMYZIDÆ.

**Phytomyza geniculata* —. Bingley, 1882, R.H.M.
P. notata Mg. Denton, 22/5/10, J.H.A.
**P. præcox* Mg. Nab Wood, 1890, R.H.M.

PHORIDÆ.

Phora nudipes Beck. Arthington, 13/3/08, J.H.A.

Since the above was set up, the following have been through the referees' hands, and thanks are due to Messrs, J. E. Collins, F. W. Edwards and P. H. Grimshaw, whose initials are appended to the species which they have verified.

Mycetophila cingulum Mg. Austwick, C.A.C., 23/2/19.
Exechia lateralis Mg. Whernside, C.A.C., 5/4/20, F.W.E.
E. spinuligera Winn. (*spinigera*), Austwick, C.A.C., 1/5/20, F.W.E.
Allodia lugens, Wied. (*ornaticollis*), Austwick, C.A.C., 1/5/20, F.W.E.
A. crassicornis Stan., Austwick, C.A.C., 17/4/20, F.W.E.
Anaclinia nemoralis Mg., Pennyghent, C.A.C., –/6/19, F.W.E.
Boletina gripha Dz. Whernside, C.A.C., 5/4/20, F.W.E.
Mycomyia tenuis, Wlk. (*Sciophila*), Clapham, C.A.C., 17/4/20, F.E.W.
Boletophila cinerea Mg. Austwick, C.A.C., 11/5/19, F.W.E.
Scatopse inermis Ruthé. Austwick, C.A.C., –/9/18, F.W.E.
Simulium ornatum, *latipes*, *variegatum* and *equinum* are recorded from Yorkshire localities in the *Bull. Ento. Resch.*, VI., 30, the first two are frequent at Austwick and Farnley.
Metriocnemus incomptus Ztt. Adel, C.A.C., 14/3/20, F.W.E.
Diamesa waltlii Mg. Austwick, C.A.C., 11/5/19, 29/12/18, Clapham, 20/4/19, F.W.E.
D. tonsa Hal. Austwick, C.A.C., 5/3/20, F.W.E.
Tanypus flaviceps Verr. m.s. Austwick, C.A.C., 18/9/19, F.W.E.
Serromyia femoratus Mg. (*Ceratopogon*). Austwick, C.A.C., 21/6/19, F.W.E.

Psychoda phalænoides, L. and P. *sexpunctata*, Curt., have been recorded by J. W. H. Johnson, from Sewage filters at Wakefield, etc.
Idioptera pulchella Mg. Austwick, C.A.C., 18/5/19.
Tipula varipennis Mg. Oughtershaw, C.A.C., 8/6/19, P.H.G.
T. plumbea F. Meltham, C.A.C., 15/5/20, P.H.G.
T. pruinosa W. Austwick, C.A.C., 10/5/19, P.H.G.
T. lunata L. Austwick, C.A.C., 18/5/19, 12/7/19, P.H.G.
T. montium Egg. Ryhill, C.A.C., 16/5/19, P.H.G.
T. peliostigma Schum. Farnley, C.A.C., 9/7/19, P.H.G.
Rhamphomyia tibialis Mg., Austwick, C.A.C., 18/5/19, J.E.C.
Empis snowdoniana Verr. m.s. Austwick, C.A.C., 18/5/19, J.E.C.
Pachymeria femorata F. Austwick, C.A.C., 15/6/19.
Hilara matrona Hal. Austwick, C.A.C., 28/6/19, J.E.C.
H. interstincta Fall. Austwick, C.A.C., 28/6/19, J.E.C.
H. litorea Fln. Farnley, C.A.C., 11/8/19, J.E.C.
H. bivitatta Strobl. Farnley, C.A.C., 11/8/19, J.E.C.
Œdalea holmgreni Ztt. Austwick, C.A.C., 21/6/19, J.E.C.
Clinocera stagnalis Hal. Austwick, C.A.C., 21/3/20.
T. longicornis Mg. Farnley, C.A.C., –/8/18, J.E.C.
T. minuta Mg. Farnley, C.A.C., –/10/19, J.E.C.
T. verralli Collin. m.s. Farnley, C.A.C., 18/6/19, J.E.C.
T. coarctata Collin, m.s. Austwick, C.A.C., 21/6/19, J.E.C.
Dolichopus planitarsis Fln. Austwick, C.A.C., 24/5/19, P.H.G.
D. wahlbergi Ztt. Gormire, C.A.C., 7/8/19, P.H.G.
D. urbanus Mg. Austwick, C.A.C., 1/6/19, P.H.G.
D. festivus Hal. Bubwith, C.A.C., 25/6/19, P.H.G.
Hercostomus germanus Wied. Austwick, C.A.C., 12/7/19, P.H.G.
H. nigripennis Fln. Austwick, C.A.C., 12/7/19; Bubwith, C.A.C., 25/6/19, P.H.G.
Gymnopternus cupreus Fln. Austwick, 28/6/19, C.A.C., P.H,G.
Pipunculus zonatus Ztt. Bubwith, 25/6/19, C.A.C., P.H.G.
P. geniculatus Mg. Spurn, 4/8/19, C.A.C., P.H.G.
P. sylvaticus Mg. Austwick, 21/6/19, 22/8/19, C.A.C., P.H.G.
Ascia dispar Mg. Adel, 11/5/20, C.A.C., P.H.G.
A. floralis Mg. Adel, 11/5/20, C.A.C., P.H.G.
Hydrotæa similis Md. Adel, 13/9/19, C.A.C., P.H.G.
Ditænia (*Chortophila*) *cinerella*. Fln. Spurn, 4/8/19, C.A.C., P.H.G.
Fucellia maritima Hal. Spurn, 3/8/19, C.A.C., P.H.G.
Cordylura ciliata Mg. Adel, 30/8/19, C.A.C., P.H.G.
C. pudica Mg. Adel, 30/8/19, C.A.C., P.H.G.
Renocera (*Sciomyza*) *pallida* Fln. Adel, 30/8/19, C.A.C., P.H.G.
Napomyza lateralis Fln. From Chrysanthemum leaves, Bradford, J.B., –/3/20.

With the foregoing lists, the total number of diptera species recorded for Yorkshire in the Victoria History List, *Bradford Scientific Journal*, *The Naturalist*, *Entomologist*, etc., now amounts to about 758 species.*

Wingate gave about 630 in his Durham Diptera, Verrall's 2nd. British List, 1901, had 2,884, he added 200 more in lists in the E.M.M., and a considerable number of others have been found.

---

* This includes all gall records, however, and in many cases the flies have not been bred out or captured.

OBSERVATIONS ON BRITISH ZOOCECIDIA.

J. W. HESLOP HARRISON, D.Sc.

Dr. Drabble and Mr. Falconer, in their recent notes in *The Naturalist*, seem to be unaware of the very considerable amount of cecidological research carried out recently by my friend Bagnall and myself.

During the course of this work, in one group alone, the *Cecidomyidae* or Gall-midges, almost three hundred species new to the British list have rewarded our efforts, and an equally imposing number of new *Eriophyidae* or Gall-mites have been secured. These results have, for the most part, been published already, although several additional species (likewise new to Britain) still require treatment. As two of these novelties formed part of my own individual ' bag ' they are recorded for convenience here ; those belonging to my friend alone, or taken by the two of us working together, will be discussed in a joint paper later.

Further, Dr. Drabble refers to the need of specialised research as to the various plants affected by any given species ; this is precisely the phase of the subject to which our later investigations have been directed. In consequence, in our last paper we gave a detailed index to the species of the *Cecidomyidae* and their food plants. Moreover, we have already commenced certain experiments with *Perrisia veronicae* to ascertain whether the species met with on *Veronica officinalis* can be transferred to *Veronica chamaedrys*. More particularly, however, the Cecidomyid galls on the various rose species and sub-species (if I may be allowed to employ the latter term in the genus *Rosa*) have been submitted to a kind of intensive culture in certain genetical studies in that genus ; work on these lines will appear shortly.*

Turning now to the species to which attention is specially drawn, they are :—

(1) *Contarinia marchali* Kieffer. In June, 1918, we had been working together in Ravensworth Woods with poor

* Excluding half-a-dozen shorter and less important articles, our published results may be consulted as follows :—1916, Bagnall and Harrison, *Ento. Record*, Vol. XXVIII., pp. 51, pp. 197-203, pp. 247-252 ; 1916, Bagnall, *Ibidem*, pp. 158-159 ; 1917, Bagnall and Harrison, *Ibidem*, Vol. XXIX, pp. 12-15, pp. 206-210, 228-230 ; 1917, Bagnall, *Lanc. and Ches. Nat.*, pp. 253-262 and 289-290. ; 1917, Harrison, *Entomologist*, Vol. L., pp. 244-246 ; 1918, Bagnall and Harrison, *Ent. Record*, Vol. XXX., pp. 61. ; 1918, Bagnall and Harrison, ' A Preliminary Catalogue of British *Cecidomyidae* (*Diptera*) with special reference to the Gall-midges of the North of England,' *Trans. Ent. Soc.*, May 16th, 1918, pp. 346-426. The last-named paper summarises the previous papers and contains the host-plant index.

results. Just before we parted Mr. Bagnall discovered a new Oak Cynipid, *Andricus trotteri*, hitherto only known from Verona, in Italy. He thereupon remarked that my turn would come on the homeward road after I left him. I began the dreary task of examining some of the enormous number of ash ' keys ' with which the trees were then decked. In spite of the fact that we had previously overhauled hundreds of ash trees in Northumberland, Durham and Yorkshire without success, on one tree in Lamesley Lane the gall of *Contarinia marchali* was discovered in some numbers. It may be recognised by a feeble inflation of the fruit accompanied by slight discoloration ; within occur gregariously nine or ten rusty yellow larvæ.

Contarinia acerplicans Kieffer. Later in the same year this species was quite common, not far from Birtley, Co. Durham, on maple (*Acer campestris*). The galls of this form consist of folds (composed of hypertrophid tissue projecting above) passing along the blade of the leaf from its re-entrant angles ; on the upper surface the galls are glabrous, but below and within are quite hairy. Amongst these white hairs lie the greyish white larvæ easily distinguishable by their colour from those of the common maple gall-midge *Perrisia acercrispans* var. *rubella*. *Contarinia acerplicans*, like the preceding, is new to Britain.

Cystiphora sonchi F. Loew. As Dr. Drabble says, this midge is described by Swanton as a southern insect ; this notion of Swanton's is quite incorrect. We recorded it in our papers in *The Entomological Record* and in the *Transactions of the Entomological Society* as abundant in Stirlingshire and north-east Northumberland, and as rare in south Northumberland and Lancashire. In Stirlingshire it was by far the commonest Cecidomyid gall near Kippen.

Cystiphora hieracii F. Loew. The gall similar to the last-named, and recorded by Dr. Drabble from *Hieracium vulgatum*, is that of the present species and has been described by us from various species of *Hieracium* in Durham, Lancashire and Westmorland.

In the genus *Cystiphora* we have secured and put on record five species new to the British list.

Perrisia veronicae Vallot. Dr. Drabble's account of the species from *Veronica montana* is not new ; I have recorded it from that plant both in the *Ent. Record* and in the *Trans. Ent. Soc.* (page 384). We also referred in the same places to its occurrence on *V. officinalis* ; since that notice I have encountered it in enormous numbers on the same plant at Corbridge-on-Tyne.

Perrisia traili Kieffer. The species collected on *Ranunculus acris* by Mr. Falconer, but not determined by him, is

Naturalist,

P. traili. We found this both in Northumberland and Durham.

Perrisia sp. We have also taken (and described) the *Perrisia* species with the milk white larvæ on two or three species of *Tilia.* Although closely allied to *Perrisia thomasiana* its characteristic larvæ show it to be quite distinct. This is certainly a new species and we shall discuss it adequately later.

Eriophyes sp. The 'erineum' on *Mercurialis perennis* seen by Mr. Falconer has not escaped us and is described from Low Fell (Durham) specimens in our paper on *Eriophyidae* which is now in the press.

——: o :——

It seems strange to see in an official programme of a well known scientific society that members 'should provide sugar!'

We regret to notice the death of Thomas John George, age 66, who has been Curator of the Northampton Museum for 36 years.

Lady Crisp has presented an oil-painting by the late James Sant of the first admission of women as Fellows of the Linnean Society, to that Society.

We have received a reprint from the American 'Review of Reviews,' entitled 'On the Trail of the Yellow-Fever Germ,' from the 'Notes of a Bystander.'

The Ministry of Agriculture and Fisheries has issued 'Potato Leaf-Curl' (Leaflet 164), and The White Rot Disease of Onion Bulbs (Leaflet 345). They can be obtained free on application to the Secretary.

The Yorkshire Weekly Post for June 12th contains an illustrated report of a meeting recently held, at which Mr. Jonas Bradley, of Haworth, well known to our readers, was presented with £200, on his retirement.

The Mayor of Scarborough, we learn from the press, recently 'gave a formal welcome to the members of the British Association of Teachers of Dancing.' We hope that one of these days another British Association may receive a welcome there.

The death is announced of Canon Rawnsley, poet, and well known for his knowledge of the Lake District; of Dr. Leonard Doncaster, Professor of Zoology at the Liverpool University; and of Mr. Charles Madeley, Public Librarian and Museum Curator of Warrington.

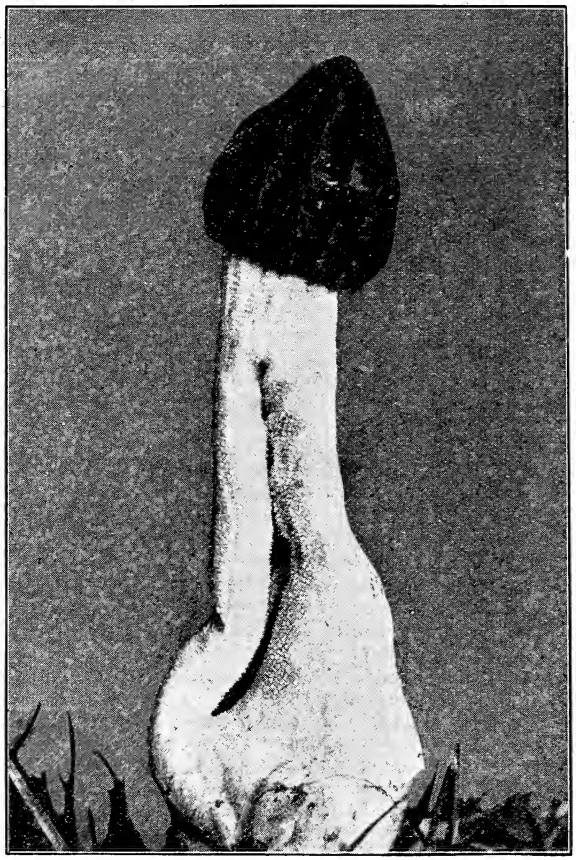
A correspondent in one of the 'dailies' states that 'a friend and I, while spending a few days at one of our most important seaside towns, went collecting zoophytes. We secured several good specimens, and, in order to obtain their correct names, we went to the free library of the town and asked the assistant librarian for a book on zoophytes.' 'We have several books on fights,' he answered, 'but I do not think we have one on fights in the Zoo.'

Part 4 of *A Geographical Bilbiography of British Ornithology* should particularly interest our readers, as it contains a list of works relating to Yorkshire, which occupies pages 336-371, and includes entries between 1590 and 1918. The part is sold at 6/- net by Messrs. Witherby & Co., and is edited by three well known bibliographers, Messrs. W. H. Mullens, H. Kirke Swann, and Rev. F. C. R. Jourdain. The Yorkshire list, of course, is a tremendous item, and we can understand a number of locally printed papers and pamphlets, as well as articles in Yorkshire Scientific Societies' proceedings, have not found their way in the Bibliography.

FIELD NOTES.

FUNGI.

Mitrophora gigas (Batsch) at Forge Valley, Scarborough.—This fungus, which is closely related to the Morels, is, I believe, generally regarded as a rarity. Previous to the following record, during eleven years' residence and



Mitrophora gigas Batsch.

fairly diligent mycological work in this locality, I had only discovered one specimen, and had heard of only one other being found during this period. On April 25th last, however, I discovered fully sixty specimens within a small area in Forge Valley ; for the most part they grew on the moist soil forming the strip of land between the high-road and the River Derwent. A few grew on the further side of the road,

but were generally smaller, and some of the finest specimens (up to 8½ ins. high) flourished within a couple of feet of the river's edge. I counted a score in view without moving my position; yet a week later could only find two or three limp and decaying specimens, the great bulk having completely disappeared. Butterbur grows luxuriantly upon this same ground, and perhaps it is worth noting that this plant was in flower at the time, but its leaves were as yet small. Much rain had fallen during a period preceding this interesting discovery. Superficially this fungus greatly resembles the Stinkhorn (*Ithyphallus impudicus*), but the two species belong to groups very wide apart.—A. E. Peck, Scarborough.

—: o :—

BOTANY.

Ribes (Ribesia, Hooker) alpinum L. in Cumberland.—The Mountain Currant was found in flower near Cumwhitton, Cumberland, during a Field meeting of the Carlisle Natural History Society, on May 1st, by Mr. F. H. Day. Only one previous record is given in the Flora of Cumberland (Hodgson), and that in the south-west corner of the county. Baker, in 'The Flora of the English Lake District,' gives the same single locality, *i.e.* 'Corney Fell, near Ulpha.' Ulpha is near Broughton-in-Furness. This is apparently the first example recorded for the East or North of Cumberland. A careful search a week later in the Cumwhitton locality failed to reveal any further examples of the shrub, but the plant upon which this note is based is well established and of vigorous growth.—L. E. Hope.

—: o :—

ENTOMOLOGY.

Anesychia funerella in Yorkshire.—I took two specimens of this rare and beautiful Tinea on Saturday, May 14th, in the vicinity of Staithes. There is one previous record for it in the Yorkshire list, Richmond, taken by Mr. J. Sang. It is one of the special Wicken Fen insects. I have taken it at light there, and probably 90 per cent of these insects in collections are from that locality.—T. Ashton Lofthouse, Linthorpe, Middlesbrough.

Curious Emergence of Cucullia verbasci.—It has long been known that the pupæ of *Cucullia verbasci* often go over two or even three winters before emergence, but one usually expects to get considerably the greater part of any particular brood out in the first year after pupation. My experience in breeding it this year, therefore, somewhat surprised me. Of the larvæ I collected from *Verbascum* plants in my neighbour, Mr. Whiteley Tolson's garden, in 1918, thirty-nine went down, and from them in 1919 eighteen specimens of the

moth emerged. This year exactly the same number of moths (18) has appeared from the remaining pupæ, and there is still one apparently healthy pupa going over another winter. In 1919 I had twenty-seven larvæ again from the same garden, at Dalton, most of which went down satisfactorily, but from them I have this year bred only three moths, so that a much larger proportion is going over, even than was the case in the previous year. The cages were carefully labelled as to dates, and there is no possibility of any mistake having been made.—GEO. T. PORRITT, Dalton, Huddersfield, June 5th, 1920.

—: o :—

DIPTERA.

A New Yorkshire Dipteron.—On the occasion of the botanical excursion to the Huddersfield district, referred to on another page, Mr. C. A. Cheetham secured *Tipula plumbea*, a species of daddy-long-legs known to frequent moorland, but not previously listed for Yorkshire. The species was common between Deerhill and Shooters' Nab, and on the Cotton-grass Mosses.—W. H. BURRELL.

—: o :—

MOLLUSCA.

White Variety of Great Black Slug (Arion ater).—On June 1st, in a field at Hilla Green, near Hackness, I found the above present in considerable numbers and of well grown dimensions. Our local experts inform me that this variety is of rare occurrence, and that specimens found are usually only small.—A. E. PECK, Scarborough.

—: o :—

FISHES.

Fringe-lipped Lamprey or Planer's Lamprey in the Derwent.—On May 26th, my son Frank caught a specimen of the above at the point where Trouts Beck enters the Derwent. Mr. W. J. Clarke, F.Z.S., to whom it was submitted, describes it as 'a rare Yorkshire fish, recorded on several occasions from the Derwent.'—A. E. PECK, Scarborough.

——: o :——

We have received the *Transactions of the Eastbourne Natural History Photographic and Literary Society* for April, which contain abstracts of quite an interesting series of papers, including one on the Little Owl, and others on Bees; The Early Inhabitants of Britain; Future of the British People; Bird Movements, etc. The Society is certainly to be congratulated on continuing its publications in these difficult times.

The Annual Report of the Yorkshire Philosophical Society for 1919, recently published, contains a paper on 'The Male Flower or Microstrobilus of *Ginkgoanthus phillipsii*,' by Thomas Johnson; and also a report on 'British Fishes and Reptiles—Pliocene to Holocene,' by A. Bell, as well as records of several interesting additions to the collection during the year. Mr. Bell principally describes Suffolk specimens, though a few are from Yorkshire.

YORKSHIRE COLEOPTERA IN 1919.

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

ntinued from page 202).

Micrurula melanocephala Marsh var. †*affinis* Steph. (Mandib. iii. 40. Manual, 119). A few by beating. Forge Valley, G. B. W.
Meligethes lumbaris Stm. Hilla Green, near Scarborough, G. B. W.
Glischrochilus (Ips.) 4-*pustulatus* L. Aysgarth, A. E. W. *65.
Telmatophilus caricis Ol. Askham Bog, G. B. W., W. J. F. *64.
†*Micrambe villosa* Heer. Abundant on broom at Hayburn Wyke, G.W.B. This species was first taken in Britain on Hawthorn, in Essex, then at Nethy Bridge in Scotland and other localities. It is rare generally on the Continent and occurs on broom, hawthorn and thistles. Of its allies *abietis* is found on firs and *vini* is abundant on gorse.
Atomaria apicalis Er. Scarborough, in cut grass, G. B. W. *62.
Atomaria ruficornis Marsh. Idle. S. Beanland (J. W. C.). *64.
Corticaria impressa Ol. (*denticulata* Gyll.). Spurn, G. B. W.
Pullus testaceus Mots. var. †*scutellaris* Muls. One at grass roots, Spurn, G. B. W.
Byrrhus dorsalis F. Teesdale, Yorks., M. L. T.
Aphodius hoemorrhoidalis L. Keighley, R. Butterfield (J. W. C.).
A. conspurcatus L. With the last, *63.
Trox scaber L. Doncaster, in classroom at Grammar School, 13th June, 1910, H. V. C.
Corymbites pectinicornis L. Wheatley, 13th June, 1907, H. V. C.
Limonius aeruginosus Ol. (*cylindricus* Pk.). Bessacar, 3rd June, 1904, H. V. C. *63.
(The above three insects were among some insects taken by the late Captain Corbett and shewn to the writer recently by Dr. Corbett. The records have apparently not previously been published).
Cryptohypnus 4-*pustulatus* F. Not uncommon in cut grass. Scalby, G. B. W., *62.
C. dermestoides Hbst. var. *tetragraphus* Germ. Aysgarth, A. E. W.
Agrilus augustulus Ill. A few by beating oaks, Melbourne, W. J. F. *61.
Helodes marginata F. Hawes, A. E. W. *65.
H. marginata ab. †*nigricans* Schilsky. Aysgarth, A. E. Winter. (Mr. Newbery tells me that this black form has not been previously noted for Britain. I took a specimen in June about four miles beyond the county boundary at Bleasdale, in Lancashire, W. J. F.).
†*Cyphon punctipennis* Shp. Nunthorpe (62) and Bubwith (61), G. B. W. This is a rare northern species, previously recorded from Scotland, Northumberland (?), Cumberland and Ireland.
Lampyris noctiluca L. Larvæ very common under stones in April in Freeholders' Wood, Aysgarth, A. E. W. Malham, one ♀ at Whitsuntide, J. W. C. (Very rare in the Bradford District).
Podabrus alpinus Pk. Ecclesall Woods, Sheffield, J. M. Brown.
Cantharis abdominalis F. var. *cyanea* Curt. Two examples at Hayburn Wyke, G. B. W.
C. paludosa Fall. Aysgarth, A. E. W.
†*Malthodes fibulatus* Kies. Forge Valley, G. B. W. A local and usually rare species, but reaching into Scotland.
M. minimus L. var. †*sanguinolentus* Schill. With the last.
M. guttifer Kies. Marley, R. Butterfield (J. W. C.).
Rhizopertha dominica F. (*pusilla* F.). Bradford, H. Bean (J. W. C.).
Dryophilus pusillus Gyll. Fairly common on felled larches, near Cloughton, G. B. W.

Ernobius mollis L. Saltaire, several in house, W. P. Winter (J. W. C.).
Anobium striatum Ol. (*domesticum* Fourc.). Selby, on a bunch of wild flowers carried by a little girl, J. W. C.
Rhagium mordax De G. Seven Arches, near Leeds, C. G. J. Caird and W. D. Hincks.
Stenochorus meridianus L. Aysgarth, one in Freeholders' Wood, A. E. W. *65.
Leptura cerambyciformis Schr. Ryecroft Glen, Sheffield, just within the county boundary on grass, June 12th, J. M. Brown. This very local species has been recorded from various localities in England and Scotland.
Leptura maculata Poda. (*armata* Hbst.). Mr. A. E. Thornes took a fine variable series at Ryhill in 1918 and Dr. Corbett has taken it profusely this year in the Doncaster district on *Heracleum*, *Rubus*, etc., including a nice dark form with the elytra entirely black except for a crescentic yellow patch at the base and a narrow yellow fascia towards the apex.
Gracilia minuta F. Hornsea Mere, by beating hawthorn, G. B. W.
Plateumaris sericea L. Scarborough, A. J. Burnley (G. B. W.) *62.
Plateumaris affinis Kunz. Aysgarth, very variable in colour, A. E. W. *65.
Cryptocephalus labiatus L. Abundant on Seamer Moor, G. B. W.
Chrysomela orichalcia Müll var. *hobsoni* Steph. Aysgarth, A. E. W.
Phytodecta pallida L. Aysgarth, A. E. W. *65.
Hydrothassa aucta F. Aysgarth, A. E. W. *65.
Throxenby, a few in cut grass. G. B. W.
Galerucella nymphea L. var. *sagittariae* Gyll. Ryhill, W. J. F., E. G. B., H. H. C. Mr. Bayford has reared the insect from larvæ brought from the reservoir margin. Mr. Newbery, who named the specimens, says that *Sagittariae* must be considered a variety of *nymphaeae* (as was suggested by Canon Fowler, *Brit. Col.* IV., 328). In Newbery and Sharp's catalogue it was given as synonymous with *grisescens* Joann, but he now considers that the latter insect is not British. Dr. Sharp (*E. M. M.*, 1910, p. 89) says there are two very variable but distinct species; *nymphaeae*, a broader insect, with a larger head and coxæ more widely separated, occurring only on water lilies, and *sagittariae*, found on a variety of plants.
Chalcoides fulvicornis F. Scarborough district, widely distributed, G. B. W. Mr. Walsh remarks that this, as usual, is probably the insect recorded as *aurata* Marsh.
Hippuriphila modeeri L. Forge Valley and Throxenby Mere by sweeping, G. B. W. *62. Aysgarth, A. E. W. *65.
Psylloides affinis Pk. Aysgarth, A. E. W. *65.
Haltica palustris Weise. Malham, J. W. C.
Phyllotreta atra Pk. Sheffield, on turnips in allotment, J. M. Brown *63.
Aphthona cyanella Redt. Forge Valley, rare, G. B. W.
Longitarsus membranaceus L. Richmond, G. B. W.
L. senecionis Bris. } With the above. Both the latter *65.
L. succineus Foud. }
Otriorhynchus dubius Ström. (*maurus* Gyll.). Cross Fell, just beyond the county boundary, M. L. T.
Polydrusus tereticollis De G. Ecclesall Woods, Sheffield, on oak, J. M. Brown *63.
Brachysomus echinatus Bons. Grassington, F. Rhodes (J. W. C.).
Barynotus squamosus Germ ab. *schönherri* Ztt. Common in cut grass, Scarborough district, G. B. W.
Alophus triguttatus F. Aysgarth, A. E. W. *65.
†*Phytonomus fasciculatus* Hbst. Spurn, under *Erodium*, G. B. W. This species occurs under *Erodium* in sandy places near the sea. Its

chief locality is Deal Sandhills, but it has occurred in other places in South England and has also been taken in Scotland.

Pissodes pini L. Eston on Scots Fir. M. L. T.

Dorytomus rufulus Bed. Common on sallows in and near Hayburn Wyke, G. B. W.

†*Codiosoma spadix* Hbst. On groynes, etc., Spurn and Humber Bank, G. B. W. Nearly all recorded localities for this species are in the south, but it has been taken in Lincolnshire.

Coeliodes rubicundus Hbst. Cottingley Wood, J. W. C.

Ceuthorhynchus quadridens Pz. Richmond, G. B. W. *65.

Anthonomus conspersus Desb. Not uncommon on Mountain Ash at Hayburn Wyke, G. B. W. (det. Colonel Deville). These are darker than the specimens taken by Mr. Thompson in Cleveland. The latter took the insect in July, after the flowers had fallen, but Mr. Walsh found his examples before the blossom appeared.

†*Elleschus bipunctatus* L. Common on sallows in and near Hayburn Wyke, G. B. W. This is a local insect but often common when it occurs.

†*Anoplus roboris* Suf. Two at Hayburn Wyke, G. B. W. A rare but widely distributed species,

Orchestes foliorum Müll. A few on sallows, Hayburn Wyke, G. B. W. *62

Cionus alauda Hbst. Forge Valley, G. B. W.

Apion gyllenhali Kub. Skipwith, G. B. W., *61.

†*Erythrapion desideratum* Sharp. Two or three specimens in cut grass, Scarborough, G. B. W. Dr. Sharp (*E. M. M.*, 1918, p. 4) in a revision of the British red *Apions* (sub-genus *Erythrapion* of Schilsky) adds three species to our fauna, of which this insect is one. It has been recorded from Scotland, Cambridge, and Claygate.

Rhynchites cupreus L. Occasional on Seamer Moor and in Sawdondale, G. B. W.

Rhynchites nanus Pk. On Seamer Moor, rarely, G. B. W. *62.

Attelabus nitens Scop. The rolls of this species were found on Skipwith Common on Oak in September, W. J. F. *61.

Pityogenes bidentatus Hbst. Common in cut pines near Cloughton, G. B. W.

Tetratoma ancora F. Lonsdale, rare, under bark, G. B. W. Our only previous record is from Raincliffe Woods (Fowler, V. 34.)

———: o :———

The Horniman Museum, Forest Hill, has issued an admirable handbook to the cases illustrating the structure of Man and the Great Apes, under the title of ' The Ascent of Man.' There are 74 pages, the book is sold at 6d., and is written by the Curator, Dr. H. S. Harrison.

We learn from the press that a pair of peregrines and a pair of buzzards have nested on either side of a narrow gully, known as Friar's Ghyll, on Melbrake, a mountain that dominates Crummock Lake, and in each case there are now nestlings ' to be fed and reared by the old birds.'

In the list of Birthday Honours we notice the name of Dr. W. Eagle Clarke, of the Royal Scottish Museum, who has received the Imperial Service Order. Dr. Eagle Clarke is well known to many of our readers, and was at one time Hon. Secretary of the Yorkshire Naturalists' Union and joint-editor of *The Naturalist*. We extend to him our congratulations.

The Geological Survey and Museum of Practical Geology, having been transferred from the Board of Education to the Department of Scientific and Industrial Research, the Lord President has appointed a fresh Geological Survey Board, which consists of Prof. W. S. Boulton, Prof. J. W. Gregory, Dr. John Horne, Prof. J. E. Marr, Mr. Frank Merricks, and Mr. W. Russell, with Sir Francis H. Ogilvie as chairman.

NEWS FROM THE MAGAZINES.

Camping for April contains rather more than usual of interesting notes on out-door life ; some are quite amusing.

A lengthy obituary notice of the late Charles Madeley, of Warrington, by E. E. Lowe, appears in *The Museums Journal* for June.

The Lancashire and Cheshire Naturalist, for June, contains reports on various neglected orders of insects, by different recorders.

The Spring number of *Bird Notes and News* contains a report of the Annual Meeting of the Royal Society for the Protection of Birds.

The Irish Naturalist for June contains 'Notes on the Basking Shark,' by R. F. Scharff, and 'Some Charophyte Notes,' by Rev. G. R. Bullock-Webster.

The principal paper in *The Scottish Naturalist*, for March-April, is on 'The Wigeon as a Scottish Breeding Species,' by Evelyn V. Baxter and Leonora Jeffrey Rintoul.

'Farming on Breck-land in Norfolk,' by S. L. Bensusan ; and 'The Technique of Cross-Fertilization in Potatoes,' by R. N. Salamon, appear in *The Journal of the Ministry of Agriculture* for May.

An account of the second Annual Dinner occupies pages 109-140 of *The Journal of the Institution of Petroleum Technologists*. The last five words of this report are 'drunk. The proceedings then terminated.'

British Birds for June contains 'Notes on the Breeding Habits of the Slavonian Grebe,' by A. D. Dubois ; 'Manx Ornithological Notes,' by P. G. Ralfe ; and 'Some Notes on the Harlequin-Duck,' by C. E. Alford.

Mr. F. Debenham's paper on 'A New Mode of Transportation by Ice : the Raised Marine Muds of South Victoria Land (Antarctica)' appears in No. 298 of *The Quarterly Journal of the Geological Society* recently issued.

A report on 'The Relation of Museums to the Advanced Student' appears in *The Museums Journal* for 'April and May.' We are sorry to see that the Museums Association is beginning to issue its publication for two months, and with two numbers on the cover of one issue.

The last number of *The New Phytologist* which has been published, contains 'A Theory of Geotropism,' by James Small ; 'Mutations and Evolution,' by R. R. Gates ; 'What is the Significance of the Efficiency Index of Plant Growth ?' by F. Kidd, C. West and G. E. Briggs; 'The Significance of the Efficiency Index of Plant Growth,' by V. H. Blackman.

Besides the usual short notes and a brief index to Vols. 4 and 5, *The Vasculum* for April contains various Ornithological notes, by George Bolam ; 'The Spider Family *Linyphiidae*,' by J. E. Hull ; 'The Chestnut and Buff Variety of the Partridge,' by E. L. Gill ; 'The Newly-Established Entomological Section,' etc., by A. D. Peacock ; 'Bird Notes from Middlesbrough,' by C. E. Milburn.

In *The Museums Journal* for June is a summary of various ways in which a hundred Museums in this country advertise. From this we learn that one method is by 'Special Articles, generally written by a member of the Staff, and often illustrated by drawings or photographs of the objects described. Here the leading place is taken by Hull, which re-publishes these numerous notes as its Quarterly Record of Additions.'

We have received a parcel of *Annales Historico-Naturales Musei Nationalis Hungarici*, among which we find (published in English, during the war) 'A Contribution to the Ornithology of Danakil-Land' ; 'Contributions to the knowledge of the "Dorylaidae,"' 'A Contribution to the Ornithology of the Eastern Soudan,' 'Some Remarks on *Cadrema louchopteroides* Walk., with description of a new Musidora from the Oriental Region.'

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London, July 1st, 1920.

AUG. 1920. No. 763
(No. 537 of current Series

THE NATURALIST

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

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;
AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, D.Sc., F.R.S., F.L.S. G. T. PORRITT, F.L.S., F.E.S.
JOHN W. TAYLOR, M.Sc. RILEY FORTUNE, F.Z.S.

Contents :—

LONDON:
A. BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.
Printers and Publishers to the Y.N.U.

Price 9d. net. Prepaid Subscription 8/6 per annum.

YORKSHIRE NATURALISTS' UNION.

DIPTERA SECTION.

A MEETING will be held at FARNLEY, LEEDS, on AUGUST 21ST, and will be led by Mr. P. H. GRIMSHAW. Meet at the Bramley Tram Depôt, 3 p.m., or Wheatfield, Farnley, 6 p.m.

C. A. CHEETHAM,
Stone Bridge Mills,
Wortley, near Leeds.

MARINE BIOLOGY COMMITTEE.

Chairman - - J. IRVING, M.D., Scarborough.

A MEETING will be held at SCARBOROUGH from the 28th to the 31st of AUGUST, 1920, and will include a visit to FILEY if desired by the majority of those attending.

Will those intending to be present please make their own arrangements for accommodation or state their wants to the Convener,

A. J. BURNLEY,
43 Moorland Road, Scarborough.

BOOKS WANTED.

Alford Nat. Hist. Soc. Reports. Set.
Barrow Nat. Field Club Trans. Vol. VII.
Bath Field Nat. and Arch. Soc. Vols. VIII.-XI.
Bedfordshire Natural History Society Proceedings. Set.
Birmingham Nat. Hist. and Phil. Soc. Proc. Vol. I., part 2.
Brighton and Sussex Natural History Society Reports, 1870, 1872-3.
Burnley Lit. and Sci. Soc. Parts 8, 12, 13, 16-27, 29-
Chester Soc. Nat. Science: Ann. Reports, i.-iv.
Cleveland Lit. & Phil. Soc. Trans. Science Section or others.
Croydon Nat. Soc. 6th Report.
Dudley and Midland Geol. etc., Soc. Vols. II.-IV.
Discovery. (Liverpool, 4to). 1891.
Derby Arch. and Nat. Hist. Soc. Part 21.
Devonshire Assoc. Adv. Science. Vols. I., II., III., XXXV., 47-
Dublin Geol. Soc. Vol. I., pt. 1, 1830?; Vol. VII., parts 1-3 (or complete Vols.). 1855.
Eastbourne Naturalist (1 part).
Eastbourne Nat. Hist. Soc. Vols. II.-III. (or parts), and part 6 of new series.
Frizinghall Naturalist. (Lithographed). Vol. I., and part 1 of Vol. II.
Garner. No. 60.
Geol. and Nat. Hist. Repository, Mackie's. Vols. II., III.
Geol. Assoc. Proc. Vol. I., Part 1.
Geol. Soc., London, Trans. 4to. 2nd series, Vol. VI., and Pts. 1-3 Vol. VI (or Vol.).
Geol. Soc. Quarterly Journal. Parts 5 and 7.
Geological Magazine, 1890-1-2-4.

Apply—**Editor, The Museum, Hu**

NOTES AND COMMENTS.

SOURCE OF TRIAS ROCK-MATERIALS.

The Proceedings of the Liverpool Geological Society, Part 4, Vol. XII. (see *The Naturalist*, pp. 211-212) contain a number of papers bearing on this interesting question. Mr. W. Hewitt has a valuable communication entitled, 'Notes on Pebbles in their Geological Associations,' in which he discusses exhaustively the mode of origin of pebbles; Mr. H. W. Greenwood makes a contribution to the study of what may be termed the 'accessory' minerals in sedimentary rocks, in a paper entitled, 'On the Distribution and Significance of Barium Compounds in Sedimentary Rocks, with special reference to the Trias.' In another paper on the Trias of the Macclesfield district, Mr. Greenwood gives an account of the heavy minerals occurring in the Triassic Sandstones, and appears to demonstrate by a comparison of positive and negative characters that the Triassic rocks of eastern Cheshire cannot have been derived from the waste of the Millstone Grit. He adds observations upon the pebbles; and upon this subject further information is furnished by Mr. T. A. Jones in a paper on 'Pebbles in the Middle Bunter Sandstones in the neighbourhood of Liverpool,' which contains a record of facts of great significance.

BUNTER PEBBLES.

As is well known, the Bunter Pebble Beds (F_2 of the official maps, F_1 being the, perhaps apocryphal, 'Lower Mottled Sandstone') contain a large variety of igneous and sedimentary rocks, including a few fossiliferous rocks, the sources of which have been much discussed. Many pebbles of quartzite and grit occur which present rather striking resemblances, on the one hand to the Torridon Sandstone, and on the other to the Ordovician rocks exposed in the quarries at the village of Mai, about three or four miles south of the ancient city of Caen, in Normandy, and hence called the Grès de Mai. At Budleigh-Salterton, on the coast of Devon, the Triassic rocks contain innumerable pebbles, not only resembling the Grès de Mai lithologically, but containing a large suite of fossils unknown save in that formation. Pebbles of this type range through the Triassic outcrops as far as Cannock Chase, and stray specimens have been found at Nottingham.

OF FRENCH ORIGIN?

Some geologists have attributed this dispersal to the agency of a river having its principal sources in Norman-Breton high lands, with tributary streams from Devon augmenting its volume. The relation of the river to the Pennine hills has presented a problem of particular interest—were the Pebble Beds of

Lancashire and Cheshire laid down by a great tributary flowing in from the north-west, and did the main river pass by Nottingham on over the site of Yorkshire, or did it cleave upon the Pennines and send one branch to the west and another to the east? The discovery by Mr. Jones of an indeterminable Orthis at Brimstage in a pebble of red quartzite raises hopes of an answer to this question, and it is to be hoped that Mr. Jones, and others inspired by his example, may make further diligent search for materials whence a decisive deduction may be drawn. Mr. Jones does not appear to have heard of the fossiliferous pebbles, not, however, of Grès de Mai type, found by the late Joseph Lomas and the writer at West Kirkby; perhaps they were never recorded.—K.

BIRDS OF BEMPTON.

We learn from *The Yorkshire Post* that at Bempton, this year, a special feature of the season is the scarcity of well-marked eggs such as are sought after by collectors; indeed, from the collector's point of view the season has been intensely disappointing. The fishermen say that large numbers of dead birds are lying about the shore. Over 200 have been picked up on the Flamborough beach with their feathers clogged with oil, no doubt from the 'tankers' that have poured out their bilges at sea, an operation which is strictly forbidden in dock. It is well known that a large number of sea birds was killed during the war through escaping petroleum from all sorts of oil-driven craft. The oil clogs their feathers to such an extent that the birds, unable to swim or dive, literally starve to death. The blowing up of the wrecked steamship Alpha, near Raincliffe, which has been in progress since January, must have had a disturbing effect on this colony of sea birds. Every time an explosion occurred they were frightened off their 'nests' on the bare ledges, and their eggs were rolled into the sea. Besides this, many birds have been killed outright by the explosions. One day a charge was blown while a climber was over the cliff, and he got the sensation of his life. Naturalists will be interested to know that only one falcon has been seen on these cliffs this season, and there is no evidence that the birds have been breeding. Their presence is betrayed by the 'killing places' where the feathers and bones of their victims lie. The Fulmer Petrels have increased this year. Three birds tenanted the cliffs last season; this season six have been seen together, so that probably in time these wanderers from the North of Scotland may nest on the Bempton Cliffs.

A BURIAL.

We learn from the press that a 'discovery which is creating considerable interest amongst antiquaries has just been made

in the Peterborough district, where a skeleton has been unearthed. It illustrates the earliest burial customs of the Neolithic or Bronze Age. The body was found in a crouching position, with the head to the north, and feet to the east, whilst the hands were pressed against the chin, the right hand being underneath the right cheek. The burial was some five feet deep, and had been made at the bottom of a ditch, forming a circular entrenchment. This is most unusual, particularly in view of the fact that the burial was carefully made. *No relics were found with the skeleton*, which, from all appearances, is that of a female, 25 to 30 years of age.' In view of the words in italics it is wonderful that the journalist has been able to fix the date as 'Neolithic or Bronze Age.' We are glad that for once the remains are not 'in an excellent state of preservation,' nor do they indicate a person of 'gigantic proportions.'

THE PLUMAGE BILL.

The summer number of *Bird Notes and News* contains the following comment on 'The Importation of Plumage Bill.' 'The one chance of the Bill's opponents lies in delay, just as it did in 1914, and for this they are playing now, as they played then, with every card in their pack. When the Committee met for the sixth time there were ten foolscap pages of amendments down, ninety-eight of which had practically the same three names to them (Messrs. Bartley Denniss, C. Williams and Archer Shee). The same thing reappeared three or four times with a slightly varied wording. On each as it came along the three or four supporters spoke as lengthily as possible, repeating the same statements, going round and round the same points, meandering and stumbling on and on and on, no matter what the words or sense so long as time was occupied. The strange contradictions and inconsistencies resulting would, if reported in full, afford a feast of absurdity to the critic who had patience to wade through the mass.'

——: o :——

As 'Handy' Guide Series, No. 4, the Echo Printing Works, Darlington have issued **Wensleydale**, by E. E. Taylor (88 pp., 7d.). It is well illustrated, contains an excellent map, and deals with Coverdale, Bishopdale, and Semerwater, and approaches, Wharfedale, Garsdale, etc., Leyburn, Middleham, Wensley, Redmire, Aysgarth, West Burton, Askrigg, Bainbridge, Hawes, and other centres. Among the 'books relating to the district' we miss Baker's 'North Yorkshire,' and the works of John Phillips.

In the same series is **Scarborough and the Yorkshire Coast,** the third edition of which has just appeared, also by E. E. Taylor (96 pp., 7d.). It covers Ravenscar, Robin Hood's Bay, Forge Valley, Hackness, Filey, Flamborough, Bridlington and other centres, and has a good map at the end, with several smaller sketch-maps and illustrations in the text.

SUSPECTED PARASITISM OF THE BEETLE HOMALOTA TRINOTATA Kr.

WM. FALCONER, F.E.S.

On September 28th, 1918, a dipterous pupa case was taken from the flower receptacle of a head of *Hieracium boreale* Fr., in Butternab Wood, near Huddersfield. It was of the elongate pale brown type, and thus different in appearance, colour and build from the stout black puparium of *Trypeta reticulata* Sch. The larvæ of the latter barwing fly, which is abundant in the Huddersfield area, cause the heads first of *H. vulgatum* Fr. (aggregate), and later of *H. boreale* Fr., to swell and bulge out conspicuously on one side, so that the merest glance is sufficient to determine whether they or the pupæ are there or not, but the unknown one gave no outward indication of its presence. On arrival home it was placed by itself in an empty test tube, the mouth of which was plugged with a wad of cotton wool, and there remained, until, very unexpectedly, in June of the following year, there came out of it an example of *H. trinotata* Kr., which, *en passant*, has not before been noted for the district. The opening made in emerging was at one end of the case, involving a small portion of one side, and was of the nature of a clean open vent. Both the beetle and the empty case were submitted to the British Museum, thence forwarded to Dr. Keilin of the Quick Laboratory, Cambridge, who was only able to say from the material supplied that the fly concerned was either a Trypetid or an Anthomyiid, probably the latter, and most likely a species of Phorbia or Chortophila. The beetle was passed on to Dr. Hugh Scott, and finally named by Dr. David Sharpe. The circumstances point to a clear case of parasitism by a species in which no such phenomenon has previously been observed. This solitary instance, however, cannot be accepted as proof positive, and it must be fully confirmed by other similar discoveries. Special search with this one end in view will be necessary. The hawkweeds are plentiful in many parts of Yorkshire, and the beetle is stated in the Victoria County History to be widely distributed also.

Several species of the somewhat allied genus, Aleochara, are known to be true parasites in dipterous puparia, and their cycle has been fully worked out.* My acknowledgments are due to Dr. Scott for some of the information used in the above note.

* Wadsworth : '*A. bilineata*,' *Journ. Econ. Biology*, X., 1915, page 1. See also *Entom. Mo. Mag.*, 1916, p. 161. Dr. Scott intends shortly publishing a short article on the parasitism of another species which he has investigated.

THE CONGLOMERATES UNDERLYING THE CARBONIFEROUS LIMESTONE IN THE N.W. OF ENGLAND.

J. A. BUTTERFIELD, M.SC., F.G.S.

I.—The Sedbergh Area.

One of the least studied of our rocks has been the Basement Conglomerate Series, occupying a position at the base of the Carboniferous Limestone in many isolated patches in the north-west of England. From a stratigraphical and petrological point of view these deposits have an important bearing, inasmuch as they give evidence of the physical conditions of climate, land surface, etc., at the time immediately preceding the deposition of the Lower Carboniferous rocks. For some years the writer has been engaged in working at these deposits.

There are three main aspects from which the problem needs to be attacked. (1) the age of the deposits and their stratigraphical position with regard to the overlying and underlying beds ; (2) the mode of accumulation, and (3) the sources from which the materials have been derived. The amount of literature relating to them is exceedingly small and of a very general nature. Mc. K. Hughes (1867),* Bird (1870),† Goodchild (1874),‡ Marr (1898),§ Oldham (1900),‖ Garwood (1912),¶ and Green (1918),** among others, have written about them, but probably most information is to be obtained from the Memoirs of the Geological Survey of the districts in which the deposits occur. The writer, at present, desires to give a few notes regarding the deposits in the Sedbergh area, neglecting for the moment the several other districts in which they are to be found. The six-inch maps covering the area are 63 N.E., 64 N.W., 48 S.E., and 49 S.W.

In this district the Basement Conglomerate Series consists of conglomerates and sandstones, all red or chocolate

* ' Notes on Geology of Parts of Yorkshire and Westmorland,' T. Mc. K. Hughes, *Y.G.P.S.*, Vol. IV., p. 565.

† ' Red Beds at base of Carb. Limestone in N.W. of England,' Bird, *Y.G.P.S.*, Vol. VI., p. 57.

‡ ' Note on the Carboniferous Conglomerates of Eastern Part of Basin of Eden,' Goodchild, *Q.J.G.S.*, Vol. XXX., pp. 390-400.

§ ' Notes on a Conglomerate near Melmerby (Cumberland),' Marr, *Q.J.G.S.*, Vol. LV., pp. 11-13.

‖ ' Basal Conglomerate of Ullswater and mode of origin,' Oldham, *Brit. Ass. Rept.*, 1900, p. 764.

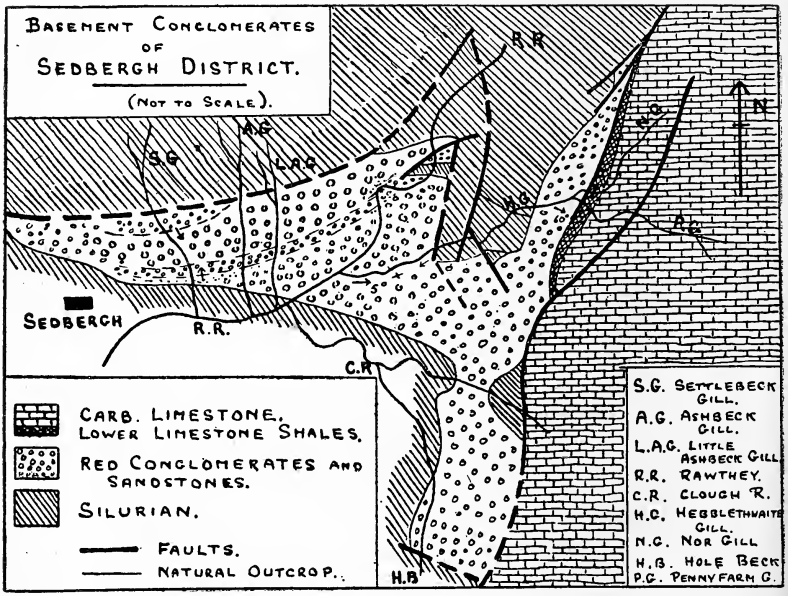
¶ ' Lower Carboniferous Succession in N.W. England,' Garwood, *Q.J.G.S.*, Vol. LXVIII.

** ' Mell Fell Conglomerate,' Green, *Proc. Geol. Assoc.*, Vol. XXIX., p. 117.

1920 Aug. 1

brown in colour.* In the Sedbergh area itself these red conglomerates vary very much in coarseness, from boulders 3 ft. across to mere grains. They contain a large se ection of pebbles, mostly rounded and sub-angular and generally locally derived, but the writer has found several which he cannot fit in with local types, and these, containing ome igneous material, should prove useful in suggesting a source for the materials in the deposits.

The conglomerates occupy the valley of the Rawthey and the Clough river, forming a roughly triangular patch with the apex to the west, and apparently filling in inequalities in



the Silurian floor. Their position suggests that they occupy a pre-Carboniferous valley, and this seems to be borne out by evidence in neighbouring districts. The conclusion seems justifiable that the drainage just before the deposition of the Carboniferous rocks in this area was somewhat similar to what it is now. The accompanying sketch-map† gives the writer's interpretation of the general distribution in this area.

* In some of the other districts this red colour is absent in the higher portion of the series, and these finer-grained light green and grey conglomerates and sandstones are of a very different composition and general character. They are probably of a later date than the deep red coarse conglomerates of the Sedbergh area; they are well developed near Tebay, at Roman Fell, near Appleby, and in a few patches near Ingleton.

† The long edge of this sketch-map represents roughly about $3\frac{1}{2}$ miles.

From this map it will be seen that the conglomerates are faulted from the underlying Silurian rocks on the north, but rest unconformably on them on the southern edge. On the eastern margin the conglomerates are faulted against the overlying Carboniferous rocks, though in the Nor Gill and Pennyfarm Gill exposures mentioned below, in spite of a very complicated section, there seems to be good evidence for a transition from the red beds into the Lower Limestone Shales (Carboniferous). The faulted margin on the north is nowhere visible, and is inferred very largely from the fact that the bounding line of the deposit is to all appearances a straight one. This would not be the case with conglomeratic deposits of the nature of these, banked up against a hillside deeply trenched with valleys, for in that case the deposits would run up the valleys. However, where decisive evidence might be obtained, the junctions are overlain with boulder clay, and it is with the utmost difficulty that even the conglomerates and the boulder clay can be differentiated.

For purposes of study the Sedbergh area is best divided up into the following four areas ;—

(1) The Gills to the north of the Rawthey.
(2) The Rawthey itself.
(3) Hebblethwaite, Nor and Pennyfarm Gills.
(4) Hole Beck, Clough River and Dove Cote Gill.

(1).—Gills North of Rawthey. (*a*) *Settlebeck Gill.* This is the first gill entering the river on the eastern edge of the town, and flows from the hills on the north. It is easily entered by striking the footpath across the fields leading to Thorns Hall. Just above the footbridge the Upper Silurian rocks are exposed, dipping very steeply N.W., and about 100 yards above the footbridge the Conglomerate Series appears in the form of red sandstones, nearly horizontally bedded and resting with marked unconformity on the upturned edges of the older rocks. This unconformity represents a long lapse of time between the deposition of the two beds. These red sandstones contain streaks and blotches which are green in colour and seem to be more calcareous than the larger red portions, but so far they have not yielded any fossils. They contain a few coarser bands and lenticles of fine grained conglomerate. Thirty yards above the junction the conglomerate is exposed alternating with sandy layers, dipping about 15 degrees upstream, and 60 yards above the junction the stream cuts through a fairly coarse conglomerate in a series of falls. The pebbles at this place vary from 5 in. to 10 in. in diameter. Further upstream a very hard and compact conglomerate is exposed with pebbles up to 15 ins. across. There are a few finer bands in it, but the major portion consists

of large well rounded pebbles in a matrix which forms a very small percentage of the whole. A little higher up in the neighbourhood of the farm the conglomerate is made up of pebbles up to 12 ins. across, but further on the pebbles get less in size, the exposures are of fine grained conglomerates, and proceeding upstream they become interbedded with sandy layers, giving rise, near the junction, to a sandy phase with scattered pebbles 1 in. or less in diameter. The junction is masked by deposits of boulder clay, but a short way upstream the Silurian rocks form a conspicuous anticline in the side of the stream, dipping very steeply towards the junction.

The deposits in this gill bring out some interesting points. In the first place a study of the relative coarseness of the deposits shows that at the bottom the sandstones, which lie unconformably on the older rocks, become replaced in a very short distance by fine-grained conglomerates, and this replacement is brought about by the interbedding of layers of conglomerate, which, starting at first as mere streaks, become wider and coarser, and finally entirely replace the sands. Then these fine grained conglomerates are in a similar manner replaced by coarse compact conglomerates which occupy the middle portion of the exposure. Further upstream the same phenomenon occurs in a reverse direction, and the coarse compact conglomerates give place to a sandy phase at the top of the exposure close to the junction. All the way through, however, there are small temporary sandy phases. It has been suggested by one writer that these deposits are flood deposits, washed from the hillsides into the valleys in times of torrential rains. If this be the true explanation then in this gill is an illustration of alternating periods of great transporting activity and relative quiescence. The middle portion of this exposure differs from the extremes in being very hard and compact, and the stream, in cutting small gorges through it, has cut the walls down perpendicularly as with a knife, the pebbles and matrix having weathered down at an equal rate.

(*To be continued*).

——: o :——

In future the price of *Man* will be increased to 2/- per copy.

The *Geological Magazine* for June contains a short paper on ' The Metamorphism of the Carrock Fell Gabbro, with a Note on the Origin of the Sulphide Veins of the Caldbeck Fells,' by Sidney Melmore.

After a period of hibernation due to the war, *The Selborne Magazine*, No. 343, September, 1919-July, 1920, makes its appearance. It contains copies of two letters from Gilbert White to Thomas Pennant ; Notes on London Birds, and a strong appeal for funds in order to preserve the Brent Valley Bird Sanctuary, particulars of which will be found in our correspondence column.

———

Naturalist,

YORKSHIRE NATURALISTS AT REETH.

Somehow the divisional Secretary for the North-west division of our County seems to command the services of the sun-god to furnish warmth and brilliance to the natural setting which he annually selects. In this respect history repeated itself for the comfort and joy of the large gathering of nature students who assembled at Reeth for the Whitsuntide recess in May last to satiate themselves with the glories of mid-Swaledale. Like the genii of a famed lamp the divisional secretary had 'requested,' so banished were dull skies and rain, and only that which was good was produced, even to catering at headquarters—Arkle House—where everything was quite satisfactory.

Although a little difficult of attainment, the visit to Reeth was well worth the making, if only for the picturesque charm of the valley drive from Richmond, while the subsequent closer acquaintance with the beauties of the fells and woods enriched the memory. Investigations were commenced on Saturday morning from the almost deserted village of Arkle Town, in Arkengarthdale. After passing through the ancient graveyard, in which cattle were grazing, and where the earliest tombstone gives date 1788, the woods, and several pretty glens, were examined. After lunch, at Langthwaite, the party proceeded up Foregill glen which runs behind Calver, the sentinel height to the west of Reeth, crossed the moorland to Healaugh by way of Old Gang Beck, and from thence to headquarters by road. The mycologists spent the whole of the day along the banks of the river Arkle, where the small belts of woodland, and bog areas, provided ample recompense for their labours.

On the following day all went by motor to Marske Bridge, six and a half miles on the way back to Richmond, and attention was chiefly paid to the woods running alongside the right bank of the Swale towards Reeth, where the richness of the floral display was greatly admired. After a rest in the grounds of Marrick Old Vicarage, the party proceeded through the village and woods, ultimately emerging close to Marrick Priory, the smallest of the Cistercian remains in Yorkshire, now used as a Church. The completion of the homeward walk was by field path near to the bank of the Swale.

On Monday an early departure was made to the village of Gunnerside, the charms of the motor run in the freshness of the day being immensely enjoyed. After conquering the boulder strewn declivity known as Gunnerside Beck, the old lead workings were reached, ascent from the valley being made to the left, the reward for the climb being a pleasing vista of the mountain range towards the head of Swaledale. Crossing the moor descent was made down Swinnergill, where was a recent immense landslide, which had practically blocked the glen. The more venturesome of the party entered Swinnergill cave, known locally as the 'kirk,' once used as the meeting place of the nonconformists in the days of their persecution. The beauties (?) of the cave were displayed by means of candle light and 'live' wire, both provided by the gentleman from York. A lengthy walk along the hill range, giving magnificent views of Keld to Nine Standards, and to right of Lovely Seat, Muker, and the Butter Tubs Pass, caused time to pass pleasantly until Gunnerside Shooting Lodge was reached, when, after an inspection of Ivelet Force, the party returned to Reeth by motor.

At the meeting held at the close of the excursion, Prof. J. H. Priestley, B.Sc., occupied the chair. Six new members were elected, and the usual sectional reports were given. Very cordial thanks were given to Mr. J. Hartshorn for making the local arrangements, and also to Mr. and Mrs. Greevz Fysher for so kindly placing at the disposal of those present the use of their motor car.—W.E.L.W.

Coleoptera.—Mr. M. L. Thompson reports that in walking across the moor into Arkengarthdale between Bowes and Reeth not many beetles

were met with. They ineluded *Bembidium mannerheimi* Schl., *Bradycellus cognatus* Gyll., *B. collaris* Pk., *B. similis* Dj., *Calathus micropterus* Duft., *Limnebius truncatellus* Thunb., *Atheta islandica* Kr., *A. tibialis* Hier., the rare *Stenus foveiccollis* Kr., (in sphagnum), *Necrophorus vespilloides* Hbst., (*mortuorum*) *Dryops* (*Parnus*) *ernesti* Gozis, *Aphodius lapponum* Gyll., and *Corymbites cupreus* var. *aeruginosus* F. At Reeth was found *Bembidium atrocœruleum* Steph., *Ægialia sabuleti* Pk., and large numbers of *Phyllobius viridicollis* F. Mr. W. Falconer picked up the brilliant *Carabus nitens* on the moors above Gunnerside.

Diptera.—Mr. C. A. Cheetham writes :—Few Diptera were seen on the Saturday, but *Tipula varipennis* Mg. might be cited from Arkle Town. In Kisdon Gorge, on the shady moss-covered sides, *Rhypholophus lineatus* Mg,. *R. nodulosus* Mcq., and *Amalopsis immaculata* Mg. were plentiful. *Chilosia fraterna* Mg. and *Empis trigramma* were in the open on *Caltha*, etc., and *Rhamphomyia sulcata* Fln. was taken with *Bibio johannis* L. for a prey.

On the road over Askern Common *Tipula plumbea* F. was noted on the Cotton Grass areas, as at Meltham, and later at Stake Fell and Pennyghent.

The Cloudberry flowers, both at Askrigg Common and Stake Fell, had numbers of *Empis lucida* Ztt. and *E. snowdoniana* Verr. M. S. Mr. J. E. Collin kindly verified these two; the former is an addition to our list, as is *Chilosia albipila* Mg., which was plentiful in Cragdale near Semerwater.

Isopoda.—Mr. W. Falconer reports four kinds of Woodlice easily recognisable in the field. *Oniscus asellus* Linn. in various situations and *Trichoniscus pusillus* Brdt. in damp humus and soil, both general and plentiful ; *Porcellio scaber* Latr. at Arkle and Cogden Gill in numbers, and *Philoscia muscorum* Scop. in the woods between Downholme Bridge and Marrick Priory, both beneath stones.

Arachnida.—Mr. Falconer writes :—In addition to the routes traversed during the meeting, Tuesday was spent in a short ramble up the Beck from Grinton as far as the Lodge, thence down Cogden Gill and along the left bank of the river below the bridge ; and Wednesday in Billy Banks Wood, Richmond. Thus a considerable amount of ground was covered, but the close searching and sifting, which are needed to bring to hand the smaller and rarer forms was impossible. One special feature was the swarms of wolf spiders in evidence everywhere running swiftly over the herbage or temporarily sheltering beneath stones. These consisted mainly of the two commonest species, both sexes being represented. Altogether 47 different kinds of spiders were observed, mostly common and widely distributed forms, the only ones scarce in Yorkshire being *Onesinda minutissima* Camb. and *Linyphia pusilla* Sund. All, however, are now definitely recorded for Swaledale for the first time, and include eight not before noted for V.C. 65. The young of two common harvestmen were met with and adults of a third, *Liobunum rotundum* Latr., *Platybunus corniger* Herm., and *Nemastoma lugubre* Müll. respectively.

Two species of false-scorpions occurred, *Obisium muscorum* Leach, odd examples on all the routes, and *Chthonius rayi* L. Koch., one female, by the stream in the Vicarage grounds, Grinton, the latter to Mr. Mason. The mites requiring apparatus to dissociate them from the material in which they live were not specially looked for, but specimens of thirteen different kinds and one variety of the larger and more easily observed sorts were obtained. In addition to these free living mites, there were noted eleven species of gall-mites.

In the list below A = Arkengarthdale, C = Cogden and Grinton Gills, D = woods between Downholme Bridge and Marrick Priory, G = Gunnerside, H = Healaugh, R = Billy Banks Wood, Richmond ; and the species new to V.C. 65 are asterisked.

General in suitable situations, *Amaurobius fenestralis* Stroem., *A. similis* Bl., *Robertus lividus* Bl., *Leptyphantes zimmermannii* Berth., *Linyphia peltata* Wid., *Pachygnatha degeerii* Sund., *Meta segmentata* Clerck., *M. merianae* Scop., *Zilla x-notata* Clerck., *Xysticus cristatus* Clerck., *Coelotes atropos* Walck., *Trochosa terricola* Thor., *Lycosa amentata* Clerck., *L. pullata* Clerck.

SPIDERS.

Segestria senoculata Linn.	A.	*Labulla thoracica* Wid.	G.
Theridion denticulatum Walck	D.	*Linyphia montana* Clerck.	D.
T. pallens Bl.	C.D.	**L. hortensis* Sund.	R.
Onesinda minutissima Cb.	G.	**L. pusilla* Sund.	C.
**Pholcomma gibbum* Westr.	R.	*Tetragnatha solandrii* Scop.	D.
Diplocephalus cristatus Bl.	R.	**Nesticus cellulanus* Clerck.	R.
D. fuscipes Bl.	D.	*Epeira cucurbitina* Clerck. imm.	D.
Entelecara crythropus Westr.	D.	**Ero thoracica* Wid.	D.
**Minyriolus pusillus* Wid.	H.	*Clubiona reclusa* Cb.	C.
Corniculata cuspidata Bl.	G.	*C. comta* C.L.K.	D.
Ædothorax retusus Westr.	D.	*Micaria pulicaria* Sund.	C.
Æ. gibbosus or *tuberosum* † Bl.	G.	*Textrix denticulata* Oliv.	D.
Microneta viaria Bl.	R.	*Cryphoeca silvicola* C.L.K.	D.
Agyneta decora Cb.	D.	*Tarentula pulverulenta* Clerck.	C.
Bathyphantes concolor Wid.	D.	*Pirata piraticus* Clerck.	A.
Poeciloneta globosa Wid.	C.	*Lycosa palustris* Linn.	C.
**Leptyphantes leprosus* Ohl.	R.		

MITES.

Euzetes globulus Nic.	D.	*Bdella pallipes* L.K.	C.
Bryobia pretiosa Koch. Gen.		*Laelaps stabularis* Koch. num.	C.
Auystis baccarum Linn. imm. Gen.		*Hypoaspis nitidissimus* Hull. num.	C.
Enemothromb.um subrasum Berl.	C.D.	*Gamasus crassipes* Linn.	C.
Sericothrombium brevimanum Berl.	C.D.	var. *longicornis* Berl.	D.
S, holosericeum Linn.	C.D.	*G. coleoptratorum* Linn.	C.D.R.
Smaris expalpis Herm.	H.	*Linopodes motatorius* Ginn.	Gen.

CONCHOLOGY.—Mr. Greevz Fysher writes :—The fine weather made observation unfavourable. Of Slugs *Limax maximus* was seen, as well as *Arion ater* which was abundant. The other species noted have been determined by Mr. John W. Taylor, M.Sc., and are as follows :—

Helix hortensis var. *lutea* 00000, and 12345	*H. alliaria*
Helicigona arbustorum	*Pyramidula rotundata*
Hygromia striolata	*Clausilia laminata*
H. hispida	*C. bidentata*
Hyalinia nitidula	*Limnæa peregra* var. *ovata*
	Ancylus fluviatilis

BOTANY.—Mr. W. H. Pearsall, M.Sc., writes :—A striking feature of the moors in the Reeth district is the considerable area dominated almost entirely by *Juncus squarrosus*. This type of moorland is not common in England, though known to exist in Teesdale and the Lake District, and it would well repay further study. In Scotland it is recognised as a wet type of *Nardus* grassland on shallow peat overlying impervious glacial 'till.' In the Arkle Valley and the head of Stonesdale, its distribution appeared to coincide roughly with that of the Yoredale shales, the grits above bearing *Calluna* and *Eriophorum* moors. Soil analyses (by Crump's method), show that these areas, at the time of our visit, were wetter than than the Eriophorum mosses; and it is possible that drainage water from the grits may run out along the lines of shale—

† The females are undistinguishable without the males.

giving rise to the lower, wetter *Juncus* slopes. The underlying peats varied from one to four feet in thickness, and in two cases observed had been formed largely by *Sphagnum* and *Eriophorum*. In these cases, *Juncus squarrosus* and *Sphagnum* were dominant, and other characteristic species were :—

Molinia coerulea	*Polytrichum strictum*
Eriophorum angustifolium	*Hypnum stramineum*
Vaccinium oxycoccus	*H. fluitans*
Scirpus caespitosus	*Aulacomnium palustre.*

Peat stratification was noticeable in many places, Mr. Burrell taking samples for further examination. Birch wood was found in the peat at altitudes from 1100-1800 feet, but appeared to be absent from the summit plateaux. In some cases, this wood occurred on the basement clay, in other cases, it was in peat a foot or more above the basement layer, and in one instance it was scattered impartially through three or more feet of peat. These peculiarities of distribution suggest that birch had appeared locally owing to drainage of the peat, through some cause. On the other hand, Lewis concluded from his investigations of Scottish high level peats, that the wood layers represent distinct and more favourable climatic conditions when the upper level of woodland was higher than at present. It is obviously difficult to reconcile the observations quoted above with the conclusion reached by Lewis, and this represents only one of the problems which can only be answered from large numbers of records of peat stratification.

Bryology.—Mr. W. H. Burrell reports :—Boulders in the river bed, near Arkle Town, showed a very restricted moss flora due perhaps to the scour of rapidly discharged flood waters in the steep-sided valley, *Dichodontium pellucidum, Grimmia apocarpa, Brachythecium plumosum, Eurhynchium rusciforme* and *Hypnum palustre* being the principal members. *Brachythecium albicans* and *Ditrichum homomallum* were seen in an adjoining quarry.

On Arkengarthdale moor at 1100 feet *Polytrichum strictum* and *Hypnum stramineum*, both in fruit, were in great profusion, with *Alicularia scalaris, Odontoschisma sphagni* and *Cephalozia connivens*.

In Stonesdale and by the Swale, near Keld, were seen in considerable quantity *Seligeria pusilla, S. recurvata, Tortula intermedia, Barbula cylindrica, Weisia curvirostris, Encalypta vulgaris* var. *pilifera, Hypnum uncinatum, Metzgeria pubescens, Lejeunia cavifolia, L. calcarea*, and *Madotheca rivularis*.

Hepatics.—Mr. F. E. Milsom, B.Sc., writes :—A general survey of the district covered by the daily excursions produced rather disappointing results in the number of species noted, but several plants were gathered which indicated that a detailed search would probably increase this number considerably. For example, parts of Arkengarthdale, and also parts of the moors above Gunnerside, were distinctly promising.

Scapania undulata was as usual the dominating hepatic of the moorland streams ; *Lophozia ventricosa* and *L. attenuata* were common all over the moors.

Marchantia polymorpha grew profusely along the banks of the Swale. It was rather remarkable, considering the limestone formation of the district, that no *Preissia quadrata* was gathered.

The following is a list of species noted :—

Conocephalum conicum.	*Cephalozia media.*
Marchantia polymorpha.	*Lophozia ventricosa.*
Metzgeria furcata.	*L. attenuata.*
Pellia epiphylla.	*L. Florkii.*
Blasia pusilla.	*L. barbata.*
Gymnocolea inflata.	*Alicularia scalaris.*
Cephalozia bicuspidata.	*A. geoscyphus* var. *suberecta.*

Lophocolea bidentata.
L. heterophylla.
Lepidozia reptans.
Scapania undulata.
S. irrigua.
Diplophyllum albicans.
Plagiochila asplenioides.
Chiloscyphus polyanthus.
Calypogeia trichomanis.

Mycology.—Mr. F. A. Mason writes :—Although considerable ground was covered by the mycologists, much of it proved unproductive, and the fungi recorded in this report were all obtained in Arkengarthdale, within a radius of about one mile from Reeth. The first fungus brought in was a very fine specimen of the Tall Morel, *Mitrophora semilibera*, collected by Mr. Fowler Jones near the Vicarage, Grinton. I visited this habitat four days later and saw several more specimens in good condition. *Cantharellus Friesii* was again found on the moorland fringe in surroundings almost identical with those in which this species was observed during the excursion to Skipton.* Few agarics were met with, the Fairy-ring Champignon and St. George's Mushroom being the most abundant ; well-developed fairy-rings of each of these edible fungi were particularly noticeable in the fields between Grinton and Marrick Priory.

The season of optimum plant-growth is also that in which parasitic fungi thrive most at the expense of their hosts, and a thorough search resulted in the discovery of no fewer than 40 different flowering plants, shrubs and trees parasitised by 42 species of fungi. The presence of certain of these latter organisms is of considerable economic importance. Whole colonies of *Allium ursinum* were attacked by *Peronospora Schleideni*, a serious pest on cultivated onions, and it would almost certainly make itself apparent in the cottage gardens of the district. The same observation applies to *Sphaerella Fragariae*, found on the wild strawberry, a leaf-spot disease dreaded by the strawberry grower. *Puccinia graminis* is destructive to cereal crops ; *Cystopus candidus*, found on *Arabis*, will attack most of the Brassicæ grown in the kitchen garden.

Prof. J. H. Priestley and Mr. Ackroyd also collected material used in compiling the following list of Fungi parasites on plants :—

Polyporus betulinus Fr.
P. hispidus Fr. On Ash.
Fomes annosus Fr. On Larch.
Uromyces Geranii Otth. et Wart. Æcidia and uredospores on *Geranium sylvaticum*.
U. Alchemillae Lév. Uredespores on *Alchemilla vulgaris*.
U. Ficariae Lév. Teleutospores on *Ranunculus Ficaria*.
U. Scillarum Wint. Teleutospores on *Scilla nutans*.
U. Dactylidis Otth. Æcidia on *Ranunculus bulbosus* and *R. repens*. Teleutospores on culms of *Dactylis glomerata*.
U. Poae Raben. Æcidia on *Ranunculus Ficaria*. Uredospores on *Poa annua*.
Puccinia Centaureae D.C. Uredospores on *Centaurea nigra*.
P. Lapsanae Fckl. Æcidia and uredospores on *Lapsana communis*.
P. Hypochoeredis Oud. Uredospores on *Hypochaeris radicata*.
P. Leontodonis Jacky. Uredospores on *Leontodon autumnalis*.
P. Chondrillae Corda. Æcidia and uredospores on *Lactuca muralis*.
P. variabilis Grev. Æcidia on *Taraxacum officinale*.
P. Taraxici Plowr. Uredospores on *Taraxacum officinale*.
P. Hieracii Mart. Uredospores on *Hieracium Pilosella* and on *H. vulgatum* var. *sejunctum*.
P. Betonicae D.C. Teleutospores on *Stachys Betonica*.
P. tumida Grev. Uredospores on *Conopodium denudatum*.
P. Chaerophylli Purt. Æcidia and uredospores on *Myrrhis odorata*.

* *The Naturalist*, this vol., p. 187.

Puccinia Violae D.C. Æcidia and uredospores on *Viola Riviniana.*
P. Malvacearum Mont. Teleutospores on *Malva rotundifolia* (Richmond).
P. fusca Wint. Teleutospores on *Anemone nemorosa.*
P. obscura Schrot. Uredospores on *Luzula campestris.*
P. oblobgata Wint. Uredospores on *Luzula sylvatica.*
P. Caricis Reb. Æcidia on *Urtica dioica.*
P. graminis Pers. Teleutospores on old culms of grasses.
P. Poarum Niels. Æcidia on *Tussilago Farfara.*
Coleosporium Tussilaginis Tul. Uredospores on *Tussilago Farfara.*
Triphragmium Ulmariae Wint. Uredospores on *Spiraea Ulmaria.*
Phragmidium Fragariastri Schröt. Caeomata and uredospores on *Potentilla Fragariastrum.*
P. mucronatum Schlecht. Caeomata and uredospores on *Rosa canina.*
Ustilago violacea Fckl. On anthers of *Lychnis diurna.*
Urocystis Anemones Schröt. On *Ranunculus repens.*
U. Violae Fischer. On *Viola canina* and *V. Riviniana.*
Cystopus candidus Lev. On leaves of *Arabis hirsuta.*
**Peronospora Schleideni* Ung. On *Allium ursinum.*
Podosphaera Oxyacanthae De By. On *Crataegus Oxyacantha.*
Sphaerotheca pannosa Lev. Perithecia on fruit of wild roses.
Sphaerella Fragariae Tul. On *Fragaria vesca.*
E. turgidus Sadeb. On *Betula alba.*

Saprophytic species occurring on fallen timber and dead leaves, or on the ground :—

Mycena alcalina Fr.
Tricholoma gambosum Fr.
**Cantharellus Friesii* Quel.
Marasmius oreades (Bolt.) Fr.
Pluteus cervinus (Schaeff.) Fr.
Galera hypnorum (Schrank) Fr.
Tubaria furfuraceus (Pers.) W. G. Sm.
Stropharia semiglobata (Batsch) Fr.
Hypholoma fasiculare (Huds.) Fr.
Panaeolus campanulatus (Linn.) Fr.
Psathyrella disseminata (Pers.) Fr.
P. gracilis (Pers.) Fr.
Anellaria separata (Linn.) Karst.
Coprinus micaceus (Bull.) Fr.
Polystictus versicolor (Linn.) Fr.
**Irpex obliquus* (Schrad.) Fr.
Stereum rugosum (Pers.) Fr.
Coniophora puteana (Schum.) Fr.
Tremella mesenterica (Retz.) Fr.
Dacryomyces stillatus (Nees) Fr.
D. deliquescens (Bull.) Duby.
Lycoperdon caelatum (Bull.) Fr.
L. pyriforme (Schaeff.) Pers.
Nectria cinnabarina (Tode) Fr.
Hypoxylon fuscum (Pers.) Fr.
Xylaria hypoxylon (Linn.) Grev.
Phyllachora graminis (Pers.) Fckl.
Rhopographus Pteridis (Sow.) Wint.
Mitrophora semilibera Lév.
Disciotis (=*Peziza*) *venosa* (Pers.) Boud.
Aleuria (=*Peziza*) *ampliata* (Pers.) Gill.
Galactinia (=*Peziza*) *badia* (Pers.) Boud.
Cilliaria (=*Lachnea*) *scutellata* (Linn.) Quel.
Cheilymenia (=*Lachnea*) *stercorea* (Pers.) Boud.
Coprobia (=*Humaria*) *granulata* (Bull.) Boud.
Ascobolus stercorarius (Bull.) Schröt.
Mollisia cinerea (Batsch) Karst.
Phacidium multivalve (D.C.) Kunz. et Schm.
Stegia Ilicis Fr.
**Lophodermium hysterioides* (Pers.) Sacc.
Pilobolus Crystallinus (Wiggers) Tode.
P. roridus (Bolt.) Pers.

Species marked with an asterisk are new to the North-west Division.

——: o :——

Some excellent reproductions of photographs of the New Sea Bank, Wainfleet, Lincolnshire, appear in *The Journal of the Ministry of Agriculture* for June.

YORKSHIRE NATURALISTS AT MARTIN BECK WOOD, NEAR DONCASTER.

With ideal weather again favouring, the excursion on Saturday, June 19th, to Martin Beck Wood, on the extreme southern limit of the county, was immensely enjoyed by the large party of naturalists present.

That the wood is an ancient one is evidenced by the fact that it is mentioned in a book in the possession of Mr. E. G. Bayford of Barnsley, published in the sixteenth century, and although not as yet properly authenticated, it is possible that it is an outlier of the more extensive Sherwood Forest, for, although within the wood are large and aged trees, yet none compare with the ancient oak trees in the adjacent Hesley Park. Therefore, it may be, that before the aforesaid wealth of intellect foregathered within this sylvan retreat to further their studies of natural history, the famed Robin Hood and his merry men found sustenance and enjoyment within its precincts.

The majority was conveyed from Doncaster railway station to its destination by motor char-a-banc; others took train to Bawtry, walking the intervening distance of two and a half miles. Under the guidance of Mr. H. H. Corbett, the whole of the wood was explored, and even if results in some sections of natural history were not quite up to the standard which the wood, by superficial glance, gave promise, the wealth and varied charm of its botanical features gave ample recompense. After lunch, amid the fringe of trees bordering the lake, the usual meeting was held, Mr. G. T. Porritt presiding. The sectional reports, which showed that investigation had been pretty thorough, were given as follows :—Vertebrate Zoology, Mr. A Haigh Lumby ; Conchology, Mr. Greevz Fysher ; Lepidoptera, Mr. Ben Morley ; Coleoptera, Mr. W. J. Fordham ; Diptera, Mr. C. A. Cheetham ; Flowering Plants, Mr. Corbett ; Mosses, Mr. W. H. Burrell ; Fungi, Messrs. W. N. Cheesman and F. A. Mason. Hearty thanks were expressed on behalf of those present by Dr. E. O. Croft, seconded by Mr. R. Fowler Jones, to Mr. Corbett for making the local arrangements, and to Mr. B. J. Whitaker for so kindly granting permission to visit the wood.

The remaining hours of the afternoon were spent in examination of portions of the wood not previously traversed.—W.E.L.W.

Vertebrate Zoology.—Mr. A. Haigh Lumby writes :—An investigation of ground under strict game preservation is not, as a rule, a very attractive proposition to the ornithologist, and particularly so with woodlands of dense growth. These factors may have influenced the sparse attendance of our Section at the Martin Beck Excursion, but happily the conditions proved more favourable than were expected, and good opportunities were available for the study of the commoner woodland species. It will be readily understood how incomplete the observations by a single member over an area of 100 acres more or less, must have been, and the failure to identify some of the species mentioned in the itinerary must not be taken as conclusive evidence of their absence, though in the case of the Wood Warbler, the presence of which is usually advertised by its unmistakable song, it would seem as if its congener, the Willow Warbler, had taken prior possession and retained it. The possible treat of hearing the nightingale did not materialise, but some compensation was made by both Blackcap and the Garden Warbler, both of which were in fine song.

The Jay, in spite of the gamekeeper's gun and egg-baited spring-trap (which we were very sorry to see) had managed to survive, but none of the other predatory species were in evidence.

The problem of distribution and status was emphasised by the presence of the Tree Sparrow, an uncommon or very local species further north in the Riding, whilst the Tree Pipit, one of our commonest songsters in Upper Airedale and Wharfedale, was only noted once.

No records were made of the mammals, reptiles and amphibians, though small lizards were met with, and a local labourer informed the writer that he often came across snakes, presumably grass snakes, when passing through the wood.

We should suggest that on future similar excursions, the ornithologists should either have half a day's start of the entomologists, or as an alternative, the latter should work a more systematic beat with the bird-men stationed on the outskirts of the wood.

Conchology.—Mr. Greevz Fysher writes :—Very few terrestrial species were seen, and of these the majority were slugs. Lacustrine species were abundant, though small in number of species. Additions were made to the known records for the wood, but on the other hand, not all of those previously known were confirmed. The following have been submitted to Mr. J. W. Taylor, M.Sc., for identification, viz., *Planorbis albus, Zua lubrica, Pisidium pusillum, P. obtusale, Arion ater* and vars. *albolateralis, castanea* and *atra, Arion circumscriptus* var. *misera* Poll., *Arion minimus* var. *alba, Limax laevis.*

Coleoptera.—Mr. W. J. Fordham writes :—Twenty-seven species of Coleoptera were obtained during the day. Beetles were decidedly scarce, but one species, *Phytodecta rufipes* De G., of which four specimens were taken on aspen, is new to the county. On this tree also occurred a few *Saperda populnea* L. flying around the higher branches. The galls of the larvæ of this species were fairly abundant on the twigs and smaller branches. Mr. Haigh Lumby took a specimen of *Clytusarietis* L., and an example of *Leiopus nebulosus* L. was beaten off oak and was rescued by the writer from Mr. Porritt's umbrella. In carrion, on a keeper's tree, Mr. B. Morley took a few *Dermestes murinus* L. and *Nitidula bipustulata* L. Other species worthy of notice were *Harpalus rufimanus* Marsh (*tardus* Brit. Cat.), *Ips oliveri* Bed. (*4-punctatus* Ol.), *Campylus linearis* L., *Malachius bipustulatus* L., *Lochmaea capreae* L., *Chalcoides fulvicornis* F., and *Deporaus betulae* L.

Hymenoptera.—Mr. W. J. Fordham states that the galls of *Andricus curvator* were abundant on oak. Mr. Corbett states that the most interesting species taken was *Psithyrus rupestris.*

Diptera.—Mr. C. A. Cheetham writes :—The most attractive group of Diptera at Martin Beck were the Volucellas : *V. bombylans* L., and *V. pellucens* L., the former being most abundant and divided fairly equally in the two forms *V. bombylans* L. and *V. plumator* De Geer. Collecting was mostly done on the marshy area where, later in the day, the mosquitoes *Culex cantans* Mg. and *C. nemorosus* Mg. made themselves very evident ; the common cleg, *Hæmatopota pluvialis* L., though present was not troublesome.

The large crane fly there was *Tipula lutescens* F., a smaller one with a fine wing pattern, *Idioptera pulchella* Mg. was also taken, this being previously only recorded from Austwick Moss.

Dolichopus æneus Deg., and *D. atratus* Mg. were frequent, and an addition to the Yorks. list, *Chrysotus gramineus* Fln., was made. *Beris geniculata* Curt. and *B. chalybeata* Forst. occurred sparingly, and also *Leptis lineola* F.

The scarcity of Empids was striking in contrast with localities in Mid-West Yorks, the only species taken being *Empis livida* L.

Amongst the Syrphids, the interesting species were *Pipizella heringi* Ztt. the only previous record being from Saltaire (A.R.S.), *Chilosia sparsa* Lw., *Syrphus tricinctus* Fln., *S. venustus* Mg., and *S. lunulatus* Mg.

Sweeping the grass gave two small flies with spotted wings, *Trypeta cylindrica* (*onotropes* Lw.) and *T. florescentiæ* L.

The Nottingham dipterists pointed out that *Dysmachus trigonus* Mg. and *Dioctria atricapilla* Mg. were frequent on the sandy parts of the Notts. area, and a careful search on the Yorks. area adjoining found the former, but not the Dioctria.

NEUROPTERA AND TRICHOPTERA.—Mr. G. T. Porritt writes :—The best species taken was the fine *Hemerobius quadrifasciatus*, which was abundant among the larches on the Nottinghamshire side of ' The Pond,' but was not seen on the Yorkshire side. With it were plenty of *Limnophilus auricula* and *L. sparsus*, with an occasional *L. griseus*. Beaten out with them were swarms of the lepidopteron *Ocnerostoma pinariella*. An interesting species was *Coniopteryx aleurodiformis*, which was apparently common in the bushes on the Yorkshire side of the narrow beck. Four species of *Chrysopa* occurred, *perla* being very plentiful, *ventralis*, *tenella*, and a fourth large species which escaped, no doubt either *flava* or *vittata*. *Panorpa germanica* was also about. Odonata noted were *Pyrrhosoma nymphula*, *Ischnura elegans*, *Agrion cyathigerum* and *A. puella*, all common, and a large species was seen but not identified, probably *Libellula quadrimaculata*.

CECIDOMYIDAE.—Mr. W. J. Fordham reports that the galls of *Harmandia petioli* Kieff, and *H. tremulae* Winn, occurred on Aspen.

HEMIPTERA.—Mr. W. J. Fordham writes :—The oak inhabiting bugs were not very numerous, but the following occurred :—*Tropicoris rufipes* L. larvæ, *Phylus melanocephalus* L., *Cyllocoris histrionicus* L., and *Psallus variabilis* Fall.

Rhopalotomus ater L. was swept from mixed herbage.

Mr. W. Bellerby states that the following species of Sphagna were met with, viz., *Sphagnum fimbriatum* Wils., *S. acutifolium* R. and W., var. *viridi*, f. *squarrosula*, *S. inundatum* W., *S. cymbifolium* W., var. *virescens*, f. *squarrosula* ; *S. crassicladum* W., var. *falcifolium*, f. *inundata* Ran.

BRYOLOGY.—Mr. W. H. Burrell writes :—The Bryologists' contribution to the day's work consisted of thirty-two species of Mosses and Liverworts, a few being dry heath forms, the greater part belonging to the boggy ground, details of which have been sent to Mr. Corbett for incorporation in his survey. The list included half-a-dozen Sphagna and a *Fossombronia*. Another interesting item was the very large quantity of fruiting *Marchantia polymorpha* seen in several stations on the drier ground, associated with *Ceratodon* and *Funaria*.

MYCOLOGY.—Mr. F. A. Mason writes :—It is not possible to form a very definite opinion of the fungus flora of any district in mid-June, but as mycological members gathered at Martin Beck in greater numbers than usual, the records for fungi were disappointing. The list of about thirty species contains nothing but what might be expected to occur in any wood at this time of the year, and except for birch-trunks, which have succumbed to the attacks of *Polyporus betulinus*, there is too little fallen timber and too much bracken to lead one to expect an extensive mycological flora.

Mr. Cheesman, in addition to giving assistance with the fungi, paid special attention to the mycetozoa and succeeded in gathering a dozen species, a list of which is included :—

FUNGI.

Amanita rubescens Fr.
Tricholoma terreum (Schaeff.) Fr.
Laccaria laccata (Scop.) B. and Br.
Collybia dryophila (Bull.) Fr.
Russula cyanoxantha (Schaeff.) Fr.
R. fragilis (Pers.) Fr.
Marasmius oreades (Bolt.) Fr.
Psilocybe foenisecii (Pers.) Fr.
Boletus elegans (Schum.) Fr.
Polyporus betulinus (Bull.) Fr.
Fomes annosus Fr.
Polystictus versicolor (Linn.) Fr.
Daedalea quercina (Linn.) Fr.
Caldesiella ferruginosa (Fr.) Sacc.
Trichoderma lignorum (Tode) Harz.
Irpex obliquus (Schrad.) Fr.
Stereum spadiceum (Pers.) Fr.
Hymenochaete rubiginosa (Schrad.) Lév.
Calocera cornea (Batsch.) Fr.
C. stricta Fr.
Phallus impudicus (Linn.) Fr.
Uromyces Ficariae (Schum.) Lév.
Puccinia oblongata Schröt.

Hypocrea rufa (Pers.) Fr.
Diatrypella quercina (Pers.) Nke.
Daldinia concentrica (Bolt.) Ces. and De Not.
Helotium cyathoides (Bull.) Karst.
Phacidium multivalve Kze. & Schm.
Stegia Ilicis Fr.

MYCETOZOA.

Physarum nutans Pers.
Fuligo septica Gmelin.
Didymium difforme Duby.
D. squamulosum Fr.
Stemonitis fusca Roth.
Comatricha nigra Schröt
Reticularia Lycoperdon Bull.
Lycogala epidendrum Fr.
Trichia varia Pers.
Arcyria cinerea Pers.
A. ferruginea Sauter.
A. nutans (Bull.) Grev.

——: o :——

Rev. W. F. Johnson writes on 'Hibernating Ichneumon Flies,' in *The Irish Naturalist* for July.

In *The Entomologist* for June *Eupithecia pusillata* and *Coccyx fimbriana* are recorded for Derbyshire for the first time.

In future fellows desiring the *Quarterly Journal of the Geological Society* will be required to pay 10/- per annum in addition to their subscription.

The New Phytologist for 'May and June," published July 10th, contains 'Physiological Anatomy of Xerophytic Selaginellas,' by J. C. T. Uphof, 'Mutations and Evolution' by R. R. Gates, and a Laboratory Note.

Among the many interesting contributions appearing in *Science Progress* for July, are Cornish Phenology; The Evolution of Man and His Mind, Some New Suggestions' and the Ice-Age Question, will appeal most particularly to our readers.

In *The Entomologist's Monthly Magazine* for June J. H. Keys writes on '*Plagiarthrina fordhamiana*: A new Subgenus and Species of *Staphylinidae*.' The specimens are named after our contributor, W. J. Fordham, who obtained them from flood refuse at Bubwith.

Mr. T. Ashton Lofthouse informs us that in the annual report of the Entomological Section of the Yorkshire Naturalists' Union, in *The Naturalist*, for December, 1919, p. 407, *Syrichthus alveolus* is recorded as having been taken by him from Pateley Bridge. This is an error as the species was the Holly Blue, *Lycaena argiolus*.

In *The Quarry* for June E. D. Nicholson writes on 'Geological Denudation,' in which he states 'without elevation, time and atmosphere we cannot have denudation; without denudation we could not have soil or food, we could not live.' In the same journal there is an article on Iceland 'Spa,' (according to its title and contents), but throughout the article the word 'Spar' is used.

The Lancashire and Cheshire Naturalist for July contains appreciative obituary notices of the late Prof. L. Doncaster and Charles Madeley. Dr. Tattersall gives 'Notes on the status of the Crayfish as an indigenous species in Lancashire and Cheshire,' and Mr. W. J. Lucas writes on '*Leucorrhina dubia*, Vanderlinden,' with plate, and on 'Odonata and Neuroptera Records for 1918 and 1919.'

The Scottish Naturalist makes a strong appeal for more subscribers if it is to survive. The part recently issued (May-June) contains 'Discovery of Horn-Sheath of the Prehistoric Celtic Shorthorn Ox in Peebleshire,' by J. Ritchie; 'Breeding Colonies of the Black-headed Gull in the Forth Area,' by W. Evans; 'Notes on the Insect Fauna of South Uist,' by P. H. Grimshaw; 'A New British Mosquito,' by F. W. Edwards; and 'The Proposed New Sub-species of the Little Owl," by W. E. Collinge. In the last note, Dr. Collinge states, 'Like Mr. Witherby I have most carefully compared all the specimens, but fail to find any other differences whatever. This being so, it seems foolish to name the British and Dutch form as a sub-species.'

ASCOBOLUS CARLETONI BOUD. IN YORKSHIRE.

F. A. MASON, F.R.M.S.

THE subject of this note is a minute, coprophilous fungus, first described by Em. Boudier, in a communication, 'Sur deux nouvelles espéces de Discomycétes d'Angleterre,' published in *Trans. Brit. Mycolog. Soc.*, IV., 1913, p. 62.

The following description is from the Latin diagnosis :— *Ascobolus Carletoni* Boud. Ascophores very small, 0.5 to 1 mm. across, entirely white, sessile on a sunken, turbinate base, disc glabrous, immarginate, furfuraceous below; paraphyses either simple or branched, irregularly thickened towards the apices, hyaline; asci clavate, 8-spored, 160—210μ × 18—20μ; spores elliptical, at first hyaline, then violet, smooth, 15-16 μ long, epispore becoming coarsely verrucose, warts pallid, 16—20μ × 10—11μ.

The fungus on which the description is based was discovered on Capercaillie dung in Scotland (Perthshire), October, 1912, since when it has been found on Blackcock dung in the same locality.

The specimens now referred to appeared on Horse dung collected in the neighbourhood of Leeds, which had been kept in a moist chamber for observation in the laboratory, and they developed after a sequence of *Pilobolus crystallinus* (Wiggers) Tode, and *Stropharia semiglobata* (Batsch) Fr. On first appearance the immature plant is quite translucent, but with the gradual development of minute scurfy particles which have the effect of scattering the light-rays, it loses transparency and becomes pure white. When mature, the asci, rendered visible by the violet spores, project well above the disc and are very conspicuous when observed under a hand-lens. In this condition the fungus is very aptly referred to by Boudier as 'Cette jolie petite espéce'. Both macroscopically and microscopically, A. *Carletoni* Boud. is a good species, readily recognised from the description and from the drawings accompanying the original paper; in all essential particulars the Yorkshire specimens were true to type.

Mr. Carleton Rea, in whose honour the species was dedicated, also kindly examined plants from the Leeds gathering, and expressed his agreement with my determination.

Hitherto known only from the original Scottish station, this is the first incidence of the species on the English side of the Border.

As an addition to the Yorkshire Flora, *A. Carletoni* Boud. is here recorded for Mid. W. Div. (V.C. 64), Leeds, May 30th, 1920. Horse dung is a new habitat for the species.

1920 Aug. 1

A TYPE COLLECTION OF YORKSHIRE DIPTERA.

CHRIS. A. CHEETHAM.

WHAT Mr. P. H. Grimshaw calls a ' first instalment ' towards the above has been put into my hands as Secretary of the diptera section ; it consists of 719 specimens, representing 415 species, all with data of capture, and verified by Mr. Grimshaw, to whom we have been much indebted for help in the identification of specimens in the past, and we offer our hearty thanks to him for this very useful gift. It should prove an incentive to the study of this interesting group, and remove some of the difficulties met with through lack of literature and type specimens.

Looking over the Yorkshire insects in the collection, the following have not been previously recorded for the county. The asterisk denotes species not in Verrall's second list :—

**Chironomus laetus* Mg.	Burley,	7/05
Cricotopus tibialis Mg.	,,	8/97
C. motitator L.	,,	7/00
**Tanypus binotatus* Wd.	,,	7/99
Limnophila nemoralis Mg.	,,	7/97
Hilara cilipes Mg.	,,	7/05
H. (Oreogeton) flavipes Mg.	,,	8/97
Trichina flavipes Mg.	,,	7/99
Tachydromia calceata Mg.	,,	7/00
**Lonchoptera furcata* Fln.	,,	7/99

Trichopticus (Hyetodesia) longipes Ztt. Richmond, 6/95
Hebecnema (Hyetodesia) umbratica Mg. Burley, 8/97
Azelia gibbera Mg. Burley, 7/05.
A. aterrima Mg. Nessfield, 7/05.
Scatophaga maculipes Ztt. Burley, 7/04.
**Dicraeus tibialis* Mcq. Whitby, 6/00.

——: o :——

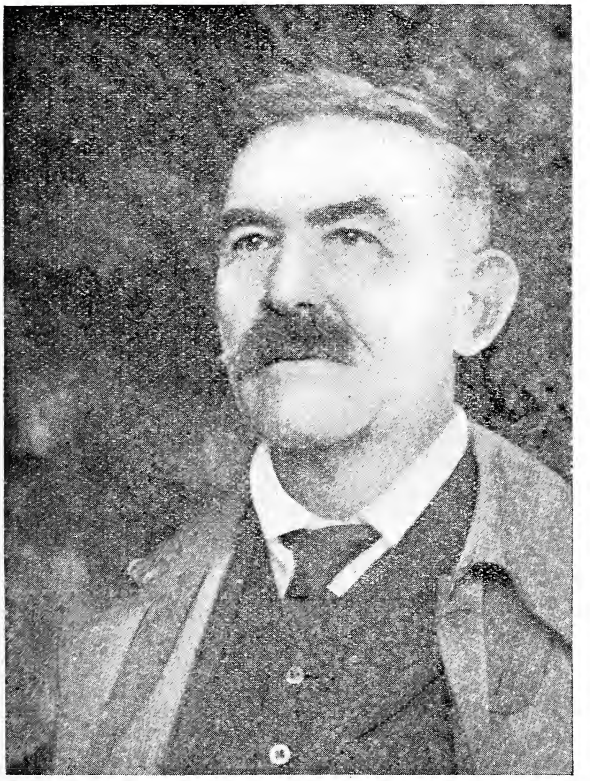
We have received the *Archives of the Cambridge University Forestry Association*, No. 3, but on this occasion we really dare not inflict upon our readers the ancient ' jokes ' about the school child being a junior-mixed, and breeding Gondolas for a Park. Evidently the fruit of the *Castanea vulgaris* tree is not familiar to the editor of the *Archives*. Otherwise, this issue is exceptionally interesting, and contains many notes bearing upon the work of the school.

The Transactions of the London and Middlesex Archaeological Society, Vol. IV., pt. 2, contain a number of papers dealing with London Maps, Inns, Churches, etc., Mr. P. M. Johnston still maintains a possible Roman date for the ' Old Camberwell Water Bottle,' and he asks why this type of vessel should not date back to Roman times. It would be more satisfying if he could produce a single authentic example among the tens of thousands of vessels found on Roman sites which exist in the various Museums in this country.

In Memoriam.

COLONEL WHEELTON HIND.

GEOLOGY has sustained a severe blow in the death, on June 21st, of Lieut.-Colonel Wheelton Hind, M.D., F.R.C.S., a former President of the Yorkshire Naturalists' Union, and



one of the most distinguished palæontologists whose work has been associated with Yorkshire.

Dr. Hind was born sixty years ago at Roxeth, near Harrow, being the son of the Rev. William Marsden Hind. He studied at Guy's Hospital and at the London University, where he graduated M.D., taking a gold medal in surgery. He settled in North Staffordshire thirty-six years ago, and had attained to a leading position among the surgical faculty in the Potteries, where he resided. He was an enthusiastic Volunteer and Territorial Officer, and before the war was in command of the local Royal Garrison Artillery. Although he was

approaching sixty he took his battery to France and saw severe service, and when invalided home was transferred to the command of a busy war hospital.

His published work on geological subjects was voluminous and his honours many. He received the Lyell award of the Geological Society in 1902, and the Lyell Medal in 1917. He was an honorary member of (among others) the Yorkshire Geological Society and of the Societé Geologique de Belgique (Liege). Most of his work has been done in connection with the Carboniferous rocks. His greatest achievement as a palæontologist was his 'Monograph on the British Carboniferous Lamellibranchiata,' published by the Palæontographical Society, in two stout volumes. He also made many contributions to our knowledge of the succession of the molluscan fossils in the Carboniferous rocks, tracing out an important and useful series of zones.

An acute controversy was produced by his discussion of 'the true position in the sequence of the rocks mapped as Yoredales,' and in this connexion his work was most intimately associated with the great problems of Yorkshire geology. Phillips, and after him Tiddeman and other writers had always regarded the Yoredales of the typical dale country and the succession of rocks in the Pendle area on the other side of the Craven Fault, as being contemporaneous in deposition, their different facies being due to the influence of the fault. Dr. Hind, arguing upon the fossil contents of the rocks, maintained that the two were of different dates, and that the Yoredales had been removed from the Pendle district before the deposition of the Pendleside series, and that on the Ingleborough district the Pendleside were similarly removed or undeveloped. The late Dr. Arthur Vaughan raised the queston whether the differences of the two series of rocks was not a question of condition rather than of age. The Yoredales had been mainly studied through their clear water corals; the Pendleside through their mud-loving mollusca. The final proof has yet to be adduced in this controversy—and now, it would appear, by some other than the two protagonists.

Dr. Hind possessed a strong and outstanding personality; he had led many excursions of Yorkshire Societies in the field, and his death is deeply regretted by his many friends.

H. E. W.

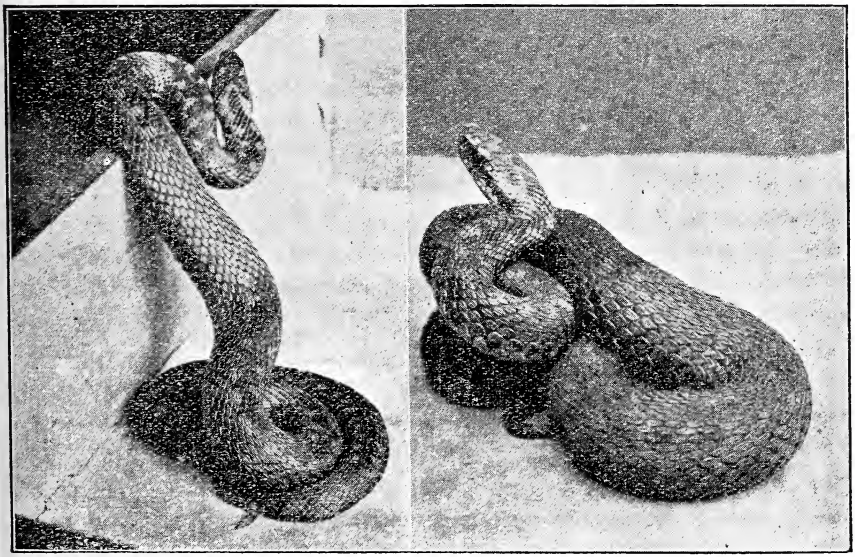
—o—

The National Trust for Places of Historic Interest and Natural Beauty, (25 Victoria Street, Westminster, S.W.1) has issued its report for 1919-20, which contains a record of the excellent work accomplished by the Trust, with photographic illustrations of some of the beauty spots which have been preserved, and a map of England and Wales showing the places held by the Trust. These seem to be principally centred around the Lake District and the Southern counties.

FIELD NOTES.

REPTILIA.

The Adder or Viper in Yorkshire.—In the locality of Langdale End, near which place rises the Yorkshire Derwent, and where moorlands and cultivated lands meet and intersect each other, the Adder exists in fair numbers and is little disturbed. On May 31st I captured one alive, two feet in length, and on submitting it to the inspection of Mr. W. J. Clarke, F.Z.S., he declared it to be a very fine female. I photographed it and exhibited it at a meeting of the Scarborough Field Naturalists' Society. Mr. Clarke informed



me that whilst the Adder could not be induced to feed in captivity, it did, in its natural state, useful service by devouring considerable numbers of small rodents. He himself had found the bodies of five such creatures in one adder. Moreover, they were not likely to bite anyone unless themselves attacked or placed in fear. For his part, he would set it at liberty as near as possible to its place of capture. During its week's captivity my specimen discharged the bodies of at least two small rodents and as it was always treated gently and never teased, it remained quite docile. Though there is a natural aversion to snakes of all kinds, and, with most persons, an impulse to kill them, I agreed with Mr. Clarke's reasoning, and restored the creature to liberty at Langdale End. I have Mr. Clarke's permission to quote him herein, though he is well

aware that many will not share his opinion. We may yet be a long way from the time when the Adder is protected by law, as are the Owls for similar services, but the view quoted is certainly interesting. Mr. Clarke informs me that a Viper in the possession of Mr. C. H. Head, some years ago, ate a Viviparous Lizard while in confinement, which is the only instance he knows of one having fed in captivity.—A. E. PECK, Scarborough.

—: o :—

ENTOMOLOGY.

The Red Admiral Butterfly in Yorkshire.—In the opinion of some British Lepidopterists, all the examples of this species recorded in the spring in this country are set down as immigrants, but in *The Field*, of the 19th June, a note appears of this Butterfly having been seen in Norfolk on March 23rd. As the Editor remarks, this insect had undoubtedly hybernated in the district. I have more than once had notes from a friend, who lives in East Kent, when he has noticed 'Red Admirals' disturbed in sheds, or from amongst ivy, in the winter months. So there can be no doubt that, in the milder parts of this country, a proportion of the 'Red Admirals' seen on the wing in August and September manage to hybernate successfully. On the 10th inst. an *atalanta* flew up from the road in front of my car, in the village of Wintringham, three miles from here. And on the 15th I saw another, evidently a female anxious to oviposit. She carefully searched (no doubt for stunted nettle plants) in a much dried up pasture, but unfortunately unsuccessfully, as long as I could keep her in sight. I saw *atalanta* and *cardui* in the Folkestone district during the last days of May this year.—W. H. St. QUINTIN, Scampston, June 25th, 1920.

It is well known that *Vanessa atalanta* hybernates in the imago state in Britain, but not nearly to the extent that do some of the other species of the same genus; and no doubt the spring specimens are also joined by immigrants. There is ample evidence, indeed, that there has been a big immigration of the species this year, as also of *Vanessa cardui*, and the latter, at any rate, seems to be spread all over the country. I watched a couple of *Vanessa atalanta* 'toying' with each other for some time in Walton Hall Woods, near Wakefield, on June 12th last, as I wished to ascertain if they paired in the spring, but although one or both of them repeatedly settled close to me, they eventually flew off without having done so. The species was also noted on the Yorkshire Naturalists' Union's Excursion to Martin Beck Wood on June 19th, but whether any of these had hibernated in Britain, or were immigrants, one cannot say. But on June 12th, 1915, I saw a specimen

in the lane leading up to Farnley Mill Wood, near Huddersfield, that seemed to be as fresh as if just out of the chrysalis. It had probably emerged late in the previous autumn, and gone into hibernation almost immediately. It seemed impossible for it to have been in such perfect condition had it crossed the channel.—G. T. P.

Vanessa cardui near Huddersfield.—It was an agreeable surprise to meet with the ' Painted Lady ' at Whitley Beaumont on Saturday, June 8th, 1920. There was a pair of them gambolling about a certain very limited area in the brilliant sunshine, frequently settling on the stones or bare ground. They displayed no aversion to one's presence, in fact flew about quite close as we sat and watched them for half-an-hour or so. Except that one had seen them alight it was somewhat difficult to locate them as they sunned themselves on the ground with outspread wings, or again with the wings folded upright over the back. The multi-colouring of both upper and under surfaces of the wings renders the butterfly more or less obscure when it has alighted.—CHARLES MOSLEY, Huddersfield.

There has been a big immigration of this species this year, as it seems to be occurring all over the country, and it was quite scarce in Britain last autumn. No doubt we shall see the produce of both it and *V. atalanta* in the autumn of this year.—G. T. P.

Phalacrocera replicata L. at Austwick Moss.—Some years ago the larvæ of this uncommon daddy long legs were found by A. R. Sanderson in the pools on Austwick Moss; he bred them out, but does not seem to have recorded them. They are a curious form of dipterous larvæ, looking exactly like a hairy caterpillar, about one inch long, and rolling up in a similar way to a caterpillar when touched ; their structure and life history are dealt with by Miall and Shelford in the *Trans. Ento. Soc. Lond.*, 1897, pp. 343-366. Their food is aquatic moss, and this is another example of the very few animals eating mosses or hepatics.* At Austwick they feed on *Hypnum fluitans* L., but eat *Hypnum cordifolium* Hedw. when supplied with it; other mosses, including *Fontinalis*, are cited by Miall. The insect was flying over the pools on May 29th this year, and I have also hatched some from pupæ collected earlier in the month. In my copy of Curtis' Diptera, issued 1862, there is a figure of this larva on Pl. 50, *Limnobia ocellaris* L. He does not mention it in the text, and it does not appear on the same plate in my copy of Vol. II., of his Brit. Entomology, dated 1824. It is an error for *Limnobia ocellaris* L., now known as *Epiphragma picta* F., most probably has a

* See *The Naturalist*, 1920, p. 190.

non-aquatic larva. *Ephiphragma picta* F. has been taken at Malham by J. W. Carter, and on June 12th last three groups, each of 8 to 12 males, were dancing in the woods amongst ferns, etc., at Ling Ghyll.—CHRIS. A. CHEETHAM.

Abundance of Psithyrus rupestris.—I have noticed many examples of this parasitic Humble-bee this month, the first on June 12th. Three of them have been caught in the house, and I have seen others in the garden, ignoring the flowers, and evidently searching for the nests of its host, the Stone Humble-bee (*B. lapidarius*), which superficially it much resembles. The Queen is distinguishable from the Queen of *lapidarius* by its dark brown wings, its large size, short and thick antennæ ; and when on the wing by its deep resonant hum.—W. H. ST. QUINTIN.

Distribution of Atheta aubei Bris. and Cercyon lugubris. Ol.—In the June issue of *The Naturalist*, Mr. Fordham, in his report for 1919 on Yorkshire Coleoptera, records *Atheta aubei* Bris. from Bubwith flood refuse, and adds that the only previous British localities are Horning Fen and Scotland. It should therefore be pointed out that the insect occurs in Cumberland in several localities, as recorded in the *Transactions of the Carlisle Nat. Hist. Soc.*, Vol. II., p. 224. *Cercyon lugubris* Ol. (*obsoletus* Gyll.) which Mr. Fordham mentions from the south of England, Northumberland and Scotland, as well as recording it as new to Yorkshire, is also a Cumberland insect, and appears in the county list referred to above, p. 214.—F. H. DAY, Carlisle, 15th June, 1920.

Insects Defoliating Oaks.—Last Saturday I passed through woods where there were numerous oaks and birches with a sprinkling of beeches and sycamores. Suspended from the oaks, by threads which glistened in the sunlight, were hundreds of small black caterpillars, and the foliage of the trees was a mass of skeleton leaves. This has been going on each summer for years ; before the tender leaves have completely developed they are attacked and their softer parts eaten away. Here, I feel sure, we have the cause of the decay of our oak trees. The beeches have also suffered severely.—E. HALLOWELL, Sowerby Bridge, June 15th, 1920.

In many parts of the country many of the forest-trees have been completely defoliated by the larvæ of the various *Hyberidae, Phigalia pilosaria, Cheimatobia brumata, Tortrix viridana* and others, but there is no evidence that this has caused the decay of the trunks of the trees.—G. T. P.

Triecphora vulnerata in Derbyshire, etc.—Published records of the occurrence in the north, of this species, the most conspicuous of the 'frog-hoppers,' seem to be scanty. Buckton, in his 'British Cicadae,' gives Edlingham Wood, near Doncaster, and Huddersfield, for Yorkshire ; while the Victoria

County History notes two localities (Burton-on-Trent and Repton) for South Derbyshire. These are quoted in Edward's 'Homoptera' without additions. I have taken this species commonly in Monk Wood, near Barlow, in North Derbyshire, and this season for the first time, in Rycroft Glen, near Dore, on the border between the two counties. Other northern records would be useful.—J. M. Brown, Sheffield.

The Small Elephant Hawk Moth in the Scarboro' district.—On Whit-Monday of last year, during a field meeting of the Scarborough Field Naturalists' Society at Ganton Wold, Mr. Harman took a female of this moth, which he presented to Mr. W. Pearson. It laid about 40 eggs, some of which Mr. Pearson kindly gave to me, and from these the moths have been reared this year.—Geo. B. Walsh, Scarborough.

Plusia moneta F. at Scarborough and Driffield—In October of last year, Mr. A Harman showed, at a meeting of the Scarborough Field Naturalists' Society, a female of this species taken at Driffield. This year the larvæ occurred on Monkshood in my own garden in Scarborough, and I also saw further specimens on the same plant in Mr. J. W. Barry's grounds at Fyling Hall. The only previous record for the Scarborough district is Robin Hood's Bay.—Geo. B. Walsh, Scarborough.

A number of larvæ of *C. montana* has been taken from Delphinium at Huddersfield this year.—G.T.P.

Mesites tardyi Curtis at Hayburn Wyke.—Among the many interesting species taken by the late Robert Lawson in this district was the weevil *Mesites tardyi*. This is an insect of Lusitanian origin, reaching its maximum British numbers in South-western England and Southern Ireland. Despite the high standing of Lawson as a coleopterist, I thought it possible that the insect might have been only a casual introduction here; and I was, therefore, extremely pleased when, in early June of this year, I beat a single specimen of the beetle from sallows at the mouth of Hayburn Wyke. With it occurred *Pogonochaerus bidentatus* Thoms., and *Cryptorrhynchus lapathi* L.; and on alders I took about a score of specimens of *Anoplus roboris* Suffr., thus confirming the new county record of last year.—Geo. B. Walsh, Scarborough.

—: o :—

BIRDS.

Partly-melanistic Chaffinch.—In *Wild Life*, 1918, p. 77, I recorded one of the above 'first noticed in May, 1917, the head, neck, breast, blackish brown; wings, tail, etc., normal.' When in the public gardens (near the river)

at Gravesend, on June 21st, 1920, I saw another, except that the melanistic portion was more extensive, covering all the plumage with exception of most of the wings, and also darker. Like most birds in towns, it was tamer than country specimens, and sat for a while within two yards of where I was. As there had been heavy rain the few days before, it was obvious the colour was not due to soot or dirt—which would also have affected the wings.—FRED. D. WELCH, Hartley, Kent.

Grey Wagtails—a nesting incident.—When my friend Ralph Chislett reported in a portfolio of the Zoological Photographic Club (and later in *Wild Life*) the incident of the Dipper conveying the cleanings from the nest down to the stream and carefully setting them afloat, I thought it a note of exceptional interest. It was, therefore, pleasing to find another species of waterside bird, a pair of Grey Wagtails, last May, in the Bolton Abbey district, going through exactly the same performance. I witnessed the operation perhaps twenty times in five hours at a distance of about three yards. Care was evidently taken invariably to place the fœces where the current was strong ; and the male on two occasions, when his deposit did not float rapidly away, waded into the stream, and carefully replaced it where the current was stronger. —JASPER ATKINSON.

—: o :—

BOTANY.

Andromeda polifolia near Halifax, Yorkshire.—*Re The Naturalist* (ante p. 220), about twelve years ago last October I found a fine patch of the above plant near Halifax, growing on the moor between Ogden Moor and Castle Carr, and I have little doubt the plant is still growing there.—E. P. BUTTERFIELD.

—: o :—

FUNGI.

Coprinus atramentarius Fr. on wool at Huddersfield.—Fox Street is one of the most unsightly parts of our town. The Exchange (or Cloth Hall) is a circular building, the walls of which are supported on the outside by very prominent buttresses placed at frequent intervals all the way round. The corners thus formed are dumping grounds for a variety of rubbish of anything but a pleasing character. On the south side especially there are usually many large bales of raw wool and the like, which not unfrequently are allowed to stay for weeks, and upon one of these bales I recently noted a clump of this fungus growing.—CHARLES MOSLEY, Huddersfield.

Psilocybe ericoea (Pers.) Fr.—On a manure heap in my garden there appeared recently a large cluster of a fungus

which has been identified as of this species by Mr. A. Clarke, who remarks, 'the habitat you name is unusual. They are fine specimens, rather larger than usual, perhaps due to the habitat.' The cluster contained nearly one hundred specimens, some of them even larger than those submitted to Mr. Clarke—measuring nearly five inches across the pileus before the edges began to curl upwards on account of age. The heap is composed almost exclusively of 'long' manure (straw and rabbit dung). Odd specimens of the same fungus have also grown in other parts of the garden where some of the same kind of manure has been put, *e.g.* around a rhubarb clump.—CHARLES MOSLEY, Huddersfield.

———: o :———

CORRESPONDENCE.

BRENT VALLEY BIRD SANCTUARY.

Sunday, July 18th, is the 200th anniversary of the birth of Gilbert White, of Selborne, who did more than any other of our countrymen to create an interest in birds; the moment is therefore ripe for an appeal upon their behalf, and for suggesting how a very fitting memorial to him may be established. The work which the Selborne Society has done in the Brent Valley Bird Sanctuary, in the way of preserving birds and testing nesting-boxes for use elsewhere, is well known, and has some considerable value. The owners of the freehold wish now to develop their estate, and if the money necessary to buy the property is not forthcoming, the Sanctuary will go. Matters have been made as easy as possible for us, and we have been asked only £4,500 for 22 acres of building land which comes into the London postal district. May I, as chairman of the Bird Sanctuary Committee, invite the help, more particularly of those who are interested in birds and in open spaces, to save the wood? Those who have been immediately interested in the work have subscribed 300 guineas to start the fund. As Gilbert White left to the English-speaking races a highly prized classic, many literary as well as scientific people and nature-lovers might also like to subscribe. I should be very glad to give further information as regards the Bird Sanctuary, and about the way in which it is proposed to celebrate the Gilbert White bicentenary.—WILFRED MARK WEBB, The Hermitage, Hanwell, W.7, July 6th.

P.S.—Subscriptions received or promised, now amount to £1600, including £1000 from an anonymous donor.—W.M.W., July 26th.

———o———

British Spas and Health Resorts, the official publication of the Federation of British Spas (Ed. J. Burrow & Co., Ltd., Cheltenham, 234 pp., 3/- net), gives information relating to the various Health resorts of the British Isles, particularly those in the Federation, under the heads of Accommodation, Climate and Attractions. Information is given relating to special diseases, the curing of which is catered for at different places.

Common Diatoms, by **Thos. K. Mellor.** London: Wesley & Sons, 16 pp.+7 plates, 6/- net, will prove very useful to the beginner, and the 400 sketches of diatoms from all parts of the world represent most of the forms he is likely to meet with. As a rule, these are sufficiently well drawn to enable the student to identify his specimens. The author has not entered into the intricacies of scientific nomenclature, the names being such as were mostly in common use during the period when the study of diatoms was at its height. There is a useful introduction.

REVIEWS AND BOOK NOTICES.

A Naturalist on the Amazons, by **H. W. Bates,** abridged and edited for schools by F. A. Bruton (Macmillan & Co., xx.+182 pp., price 2/6). Mr. Bruton has succeeded in extracting a fascinating narrative for the benefit of scholars, although to attempt to abridge Bates's well known work seems almost like sacrilege. The volume is illustrated by 80 figures from photographs of specimens in the Manchester Grammar School Museum, the Liverpool Public Museum, etc.

The Camping Club of Great Britain and Ireland has issued its **Handbook of Light-Weight Camping** (4 New Union Street, London, E.C.2, 164 pp.). It contains an admirable series of practical essays dealing with every aspect of outdoor camping life. The illustrations are numerous and excellent, and in every way the book will be found useful to the increasing number of people who are indulging in open-air life. It also contains many useful hints for those who are fond of the countryside, although they may not sleep under canvas. The editor is H. W. Watson.

Wild Flowers and How to Know Them, by **Stanley C. Johnson, D.Sc.** London: Holden and Hardingham, pp. ix. and 132. 1/- net. This is a companion volume to 'Wild Flowers' and 'British Trees,' and is a small pocket guide to the identification of our wild fruits. The term 'wild' is generously interpreted as it includes the Spanish Chestnut, Walnut, Mulberry, Plane and others. The fruits of trees and shrubs claim chief attention, but a short chapter at the close deals with about a dozen 'miscellaneous plants.' There are 70 sketches, illustrating the more common fruits. As usual, in popular descriptions, misleading statements often occur, *e.g.*, a developing fruit, it is said, '*selects* some unattractive guise,' the *leaves* of the Gorse 'appear as ruthless spines,' and the flowers of this shrub are said to be 'more or less rolled into an ovoid shape.' Thus, while technical descriptions are usually avoided, identification is not necessarily rendered less difficult.

British Wild Flowers, their Haunts and Associations, by **William Graveson.** London: Swarthmore Press, pp. 320, 6/6 net. In the belief that the popular fancy is attracted more by the folk-lore and legends which have gathered round so many of our wild flowers than by technical descriptions of form and function, this volume has been written. Beginning with the 'harbingers of spring,' the common species are dealt with month by month in a readable manner, and almost every page contains references to quaint beliefs of the old herbalists, delightful country legends or appropriate lines from the poets. Simple descriptions are often given of the species, and these, together with the useful figures on 36 plates, and the floral calendar giving names, habitat, colour, duration and growth, enable the reader to identify the commoner plants found during a country walk. The book will be welcome to flower lovers and can be read with interest by the more orthodox botanist.

Practical Plant Biochemistry, by **Muriel Wheldale Onslow.** Cambridge University Press: pp. 178, 15/- net. Botanists will welcome this work as a much needed and useful guide to the study of plant compounds. The author's previous researches have proved a valuable training for a difficult task. An elementary knowledge of organic chemistry is assumed, but given that, the course here outlined may be followed with little difficulty, and this work will encourage botanists to pay more attention to biochemistry in their advanced courses than has hitherto been the custom. That we are here on the borderland of the unknown is made obvious by the frequent use of such phrases as 'it is not clear,' 'is suggested' or 'obscure,' 'beyond our knowledge,' 'unknown,' 'probable,' 'it is assumed,' and so on throughout the book. There is a short but helpful introduction, and in the remaining nine chapters are brief accounts of, and practical exercises on, the colloidal state, enzyme

action, carbon assimilation, carbohydrates, fats and lipases, proteins and proteases, glucosides and the plant bases. The author is to be congratulated on having produced a clearly written, well arranged and reliable laboratory guide.

Fresh Water Fishing, by **A. R. Matthews,** Editor of ' The Angler's News': Cassell & Co., Ltd., 2/6 net. Mr. Matthews, as one would naturally expect from an angler of his experience, has produced a thoroughly readable and practical handbook, and at an appropriate time, *i.e.*, upon the eve of the opening of the ' coarse ' fish season. It is almost entirely confined to the methods and materials adopted for the capture of this class of fish, for of its 183 pages, we find only 19½ devoted to the pursuit of ' game ' fish; six to a description of trout fly rods and tackle; seven upon ' How to Fish for Trout ' ; five pages to grayling, one page only to salmon, and only half-a-page to perhaps the most sporting fish of the lot, the sea trout. The advice given should be very helpful to the tyro in selecting his outfit, and capturing his fish, for not only are their haunts and habits described, but the best method of selecting a swim, and ground baiting it, and the most killing way of presenting the bait is most clearly described. The book is well illustrated. The identification of Roach and Rudd, Chub and Dace often present difficulties to the angler, the plates provided illustrate in the clearest manner the distinguishing features between these closely allied species. Two charming photographs, by the author, of delightful ' fishy ' spots, form the frontispiece.—R.F.

Rambles Round Grassington by Hedgerow and Highway, by **John Crowther,** about 72 pages, 2s. 6d. net. T. A. J. Waddington, York. The author gathers together about thirty accounts of rambles after the following style, ' In the first field, keep to L., go through gate on R. of a stile, and then through the gate to L., after which go up R. side of wall and you will see the stile opposite ; cross the narrow field, keeping to L., and after passing three gates you will see another style. Passing along, views of Thorpe Fells and Elbolton are seen on L., and Hebden Gill and Sanatorium on R. Keep to R., and pass through two gates across a large field to a stile, walk along the footpath to next stile, turn to L., and at the bottom, keep to path near the wall, which will lead you to the stepping stones and Linton Church. If not desirous of crossing the stepping stones, go over the stile on R., pass the Old Mill, and up the Lane into Hebden Road.' We learn that the letter R. means 'turn and keep to the right,' etc. There are some illustrations and sketches and a good map. There are advertisements in plenty. The volume is dedicated to the Grassington men who fell in the war. There is a picture of a sword, apparently of the Napoleonic period, labelled ' Roman Sword found at Skirethornes.' There are accounts of antiquities, some very fragmentary remains being figured, though these are to be described in a further work now in preparation, which should be interesting. There are occasional references to the flowering plants, and Roman Coins. The author calls himself ' The Grassington Antiquary.' and gives his address as ' The Museum, Grassington.'

——: o :——

At a recent meeting of the Lincolnshire Naturalists' Union, to Barton-on-Humber, according to the *Yorkshire Post,* ' the visitors discovered a number of specimens, some of them being very rarely found in the neighbourhood, in particular the *aloepecurbus bulbosus, bee orchis, equisetum* (horse tail) *arveuse* crossed with a limesum variety of fluviatile. Mr. Sheppard explained the various fine fossils that had been secured, including a complete fossil salmon, in the chalk, nearly three feet long. Fossil mushrooms and other examples were exhibited.' It sounds rather like an angling match !

NORTHERN NEWS.

The extra pages in our July issue were due to the generosity of one of our contributors.

One of the sections in the admirable report of the Taunton Castle Museum, recently issued, is headed, '*Animals*, Birds, Insects,' etc.

As *Leaflet No.* 315, the Ministry of Agriculture and Fisheries has issued 'Suggestions and Chart for the General Cropping Manuring and Cultivation of Allotments.'

The *Forty-ninth Annual Report of the Public Libraries, Art Gallery and Museums Committee of Rochdale* contains details of the work accomplished by these institutions.

Messrs. Witherby have published part 5 of *A Geographical Bibliography of British Ornithology*, which deals largely with Wales and Scotland. It contains pp. 385 to 480, and is sold at 6/- net.

The Presidential Address of Commander J. J. Walker on 'The Fringes of Butterfly Life' given to the Entomological Society of London, appears in the Society's Transactions, part 5, recently issued.

The admirably illustrated and well printed monthly journal of the Patriotic League, called *Overseas*, for June, contains an article on 'The Life of the Otter in Great Britain,' written and illustrated by photographs by Riley Fortune.

The Journal of the Manchester Geographical Society issued in May, 1920, is a substantial record of work, and besides general articles on Geography, contains Memoirs and Portraits of the late F. Zimmern and the late Harry Sowerbutts.

Major S. S. Flower, the director, has sent us Publication No. 30, which contains the *Report of the Zoological Service, Cairo*, for the year 1914-1918 (86 pp. 3/-). It includes Notes on Egrets, by J. L. Bonhote, etc. Publication No. 31 contains the Report for 1919.

No. 299 of the *Quarterly Journal of the Geological Society* contains a paper on 'The Pleistocene Deposits around Cambridge,' by Prof. J. E. Marr, and 'On a Deposit of Interglacial Loess, and some Transported Pre-glacial Freshwater Clays on the Durham Coast,' by Dr. C. T. Trechmann.

The Preliminary Programme and Invitation circular issued in connexion with the Cardiff meeting of the *British Association*, to be held in August, is on a new plan, and we think is preferable to the old one. It is octavo in size, and consists of 12 pages containing useful information for intending visitors.

Part 7-8 (completing Vol. I.) of *A Practical Handbook of British Birds*, edited by H. F. Witherby, appeared in April, and completes the Passeres. There is a title page, index, etc. Editor and publishers are to be congratulated on the completion of a substantial part of their work in these difficult times.

Mr. Albany F. Major's presidential address given at the Jubilee meeting of the *Croydon Natural History and Scientific Society*, which is entitled 'Surrey, London and the Saxon Conquest, with an appendix on the Course of the Roman Road through Croydon,' has been published by the Society at 1/6 post free.

A step in the right direction has been taken by the Town Council at Warrington in appointing Mr. G. A. Dunlop as Curator of the Warrington Museum, and appointing a librarian to look after the library. It is evidently felt that if these gentlemen do their work properly there is quite plenty to keep them going, and it is not advisable for one man to try to look after both Library and Museum.

Mr. Chris. A. Cheetham informs us that a meeting of all interested in Diptera will be held at Farnley, Leeds, on August 21st. Mr. Grimshaw has promised to be present and will give advice on the collection and verification of this group of insects. The collection will be inspected in the evening, and this will give an opportunity to voice thanks to the donor of the collection referred to on another page.

Twelve Illustrations, beautifully printed in colours and Mounted on Stout Boards, 24 × 19 inches, eyeletted and strung, including Descriptive Hand book, in Leather Board Case 17/6 net the set.

BROWNS'
ENEMIES OF THE GARDEN

Reproduced in the very best style of Lithography from special designs by
H. W. BRUTZER, M.A., F.E.S.

THE 12 ILLUSTRATIONS ARE AS FOLLOWS :

1. OUTLINE OF INSECT LIFE.—Hymenoptera, Coleoptera, Lepidoptera, details.
2. LACKEY MOTH.—Egg, Caterpillar, Nest, Cocoons, Female Lackey Moth, Egg Cluster.
3. SMALL ERMINE MOTH.—Eggs, Caterpillar, Cocoons, Ermine Moth, Nest in Apple Tree.
4. GOOSEBERRY SAWFLY.—Egg, Larva, Larva (last stage), Leaf, Sawfly, Branch, Cocoon.
5. ASPARAGUS BEETLE.—Eggs, Larva, Beetle, Pupa, Asparagus stripped of leaves, Cocoon.
6. BLACK CURRANT MITE.—Mite, Big Bud on Branch, Section of Bud with Mites.
7. RASPBERRY STEM BUD CATERPILLAR.—Caterpillar, Chrysalis, Moth (enlarged), Raspberry Cane.
8. MILLIPEDES and CENTIPEDES.—Three destructive Millipedes and two useful Centipedes.
9. SCALE.—Currant Scale, Scale on Aralia and Myrtle Leaves and Mussel Scale.
10. WIREWORMS.—Click Beetle and Skip Jack showing details.
11. PEA THRIPS, COCKCHAFER, DADDY LONGLEGS, WOOD-LOUSE and EARWIG, showing sections and details.
12. SOME USEFUL INSECTS.—Dragon Fly, Ichneumon Fly, Lady Bird, Tiger Beetle, Hover Fly, Glow Worm, Cocktail Beetle, Lacewing Fly.

All the designs are printed on appropriately tinted backgrounds, devoid of any white border, thus enabling the various sections on the Charts to be seen with great clearness.

We always have enemies within our garden-gates, and would-be gardeners are often reminded that the results of their labours may be brought to nought or greatly lessened by the work of destructive insects. There are other insects, however, that are our Allies, as they live on the destructive pests and thus help to protect the vegetables and fruit. It is, therefore, most necessary to be able to distinguish between useful and destructive insects, hence the popularity of **Browns' "Enemies of the Garden,"** as the charts show at a glance how to tell our enemies from our friends. A set of the illustrations should be exhibited in all our schools or village clubs, as the knowledge which they and their accompanying handbook convey is essential to successful gardening. The small expenditure on same will prove a truly profitable investment.

LONDON: A. BROWN & SONS, LTD., 5, FARRINGDON AVENUE, E.C.4.
AND AT HULL AND YORK.

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London. Aug. 1st, 1920.

SEPT. 1920. No. 764
(No. 538 of current Series

THE NATURALIST.

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

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;
AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
G. T. PORRITT, F.L.S., F.E.S.
JOHN W. TAYLOR, M.Sc. **RILEY FORTUNE, F.Z.S.**

Contents :—

LONDON:
A. BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.
Printers and Publishers to the Y.N.U.

Price 9d. net. Prepaid Subscription 8/6 per annum.

BOOKS FOR SALE.

Beetles and Spiders. Sedgewick. 1/-
British Non-Marine Mollusca. Swanton. 1/6
Lessons on Shells. 1/6
Half Hours with the Microscope. West. 1/-
Astronomy, Clerke, Fowler and Gore. 4/-
Beasts, Birds and Bees of Virgil. Royds. 2/-
Our Country's Animals. Col. Pls. Gordon. 3/6
Rust, Smut, Mildew and Mould. Col. Pls. Cooke. 3/-
The Animal World. Gamble. 1/-
Reptile Life. Pycraft. 2/-
The Nature Lovers' Handbook. Kearton, etc. 2/6
History of the Oxford Museum. 2/6
Medical Contributions to the Study of Evolution. Adami. 7/6
Fourth International Ornithological Congress, Proc. 1905. 10/-
Evolution in the Past. Knipe. Pls. 7/6
Aristotle's Researches in Natural Science. Lownes. 4/6
Turner on Birds. 1544. Evans. 5/-
A Veteran Naturalist (Tegetmeier). Richardson. 5/-
Reptiles and Batrachians. Boulenger. Pl. 10/6
Darwin and the Problem of Life. Gunther. 7/6
Growth and Form. Thompson. 15/-
Waves of the Sea. Cornish. 5/-
Waves of Sand & Snow. Cornish. 5/-
Life of Crustacea. Calmen. 5/-
Plant Life in Alpine Switzerland. Arber. 4/6
Nature Near London. Jefferies. 4/-
A Picture Book of Evolution. 2 Vols. 2/6 a vol.
Conditions of Life in the Sea. Johnstone. 5/-
British Ferns. Col. Pls. Druery. 5/-
The Further Evolution of Man. Calvert. 4/-
Life and Evolution. Hedley. 4/6
Harmsworth Natural History. 3 Vols. 10/- each.
Lessons from Nature. Mivart. 4/-
Heredity. Thompson. 5/-
Darwinism and Human Life. Thompson. 4/6
Wild Traits in Tame Animals. Robinson. 4/6
The Lessons of Evolution. Hutton. 2/6
Hills and the Vales. Jefferies. 4/6
Animal Life under Water. Ward. 5/-
The Open Air. Col. Pls. Jefferies. 4/-
The Chrysanthemum. F. W. Burbridge. 2/6
Report on Agricultural Damage by Vermin and Birds in the Counties of Norfolk and Oxfordshire in 1916. R. T. Gunther. 1/6
Hunting in British East Africa. Madeira. 7/6
Spencer Fullerton Baird. By Dall. 7/6
The Greatest Life. Leighton. 3/-
The Yorkshireman. By a Friend. Vol. I., Pontefract, 1833. 3/6
Derby: Its Rise and Progress. Davison. 2/6
Animal Romances. Renshaw. 4/-
The Scientific Enquirer. Cloth. Vols. I. and III. 2/- each.
The Making of Species. Dewar and Finn. 4/-
Rambles of a Canadian Naturalist. Coloured Illust. S. T. Wood. 3/6
How to Lay out Suburban Home Grounds. Kellaway. (Pubd. at 8/6). 3/6
What is Instinct ? C. Bingham Newland. 2/6
Vigour and Heredity. J. Lewis Bonhote. 5/-
Mendel's Principles of Heredity. Col. Pls. Bateson. 5/-
Genesis of Rocks and Ores. Symons. 4/6
'The Suk' Language and Folk-lore. Beech. 3/6
Animal Life and Human Progress. Dendy. 6/6
The Book of a Naturalist. Hudson. 7/6

Published Records of Land and Fresh-Water Mollusca, East Riding. (Maps). T. Petch, B.Sc., B.A. 1/6

Apply—**Dept. C, c/o A. BROWN & SONS, Ltd., Hull.**

NOTES AND COMMENTS.

THE MUSEUMS ASSOCIATION.

The Annual Conference of the Museums Association, at Winchester, was held between July 5th to 8th, under the Presidency of Sir Martin Conway, M.P., Director General of the Imperial War Museum, whose address contained many useful hints to those contemplating exhibitions of war relics.* Among the papers of particular interest which were read and discussed were 'The Lighting of Museums and Art Galleries,' by S. H. Seager; 'The Public Libraries Act of 1919, and its effect on the future policy of Museums,' by E. E. Lowe; 'The Desirability of a Diploma for Museum Curators, and the necessary course of training,' by Dr. W. Evans Hoyle; 'The Selection of Pictures for Municipal Art Galleries,' by E. Howarth (part taken as read); 'The Teaching of Art in local Museums,' by M. J. Rendal; 'Suggestion for a Bureau of Exchange,' by J. H. Allchin; 'Some Advantages of a Central Museum Board,' by Dr. F. A. Bather; 'The Need for an Imperial Department of Illustrated Public Information,' by J. A. C. Deas (taken as read); 'The Child and the Mummy,' by the Director of Education, Winchester; 'The Classification of the subject matter of Anthropology,' by E. N. Fallaize; 'An Indian Museum and Picture Gallery,' by E. R. Dibdin.

VISITS TO MUSEUMS.

Visits were paid to the two Museums at Winchester, to the Cathedral, St. Cross Church and Hospital, Winchester Castle, Winchester College and its Museum, and the Cathedral Library. In connection with these, papers were read describing the contents of the Museums, etc., and the visitors were personally conducted by Canon Vaughan or others. The Conference was attended by a number of Museum Directors from France, which accounted for the following items on the agenda :—'Biography of Comte de Lacépède (1756-1825), Professor and Director of the Paris Natural History Museum,' by M. le Professor Louis Roule; 'Paris Museum: The Association of Curators of Public Collections in France,' by Dr. A. Loir (Secretary, French Museums Association). On one of the excursions an exceedingly rare Clog Almanack in runic characters was exhibited. Very few examples are known in this country, although one was found in Holderness about 30 years ago, and realised £30, but it was nothing like so fine as the example shown at Winchester. It is now in the Museum at Hull.

* Since printed in *The Museums Journal* for August.

PROF. G. FREDERICK WRIGHT.*

Prof. Wright, whose works on the Ice Age in this country and in America, on the antiquity of man, etc., are well known to our readers, and whose visits to this country have enabled many geologists to become personally acquainted with him, has issued his life's story. In this he reviews his childhood days, his college days, 10 years in a country parish, 10 years at Andover, and then refers to his work in Europe and Asia. Then follow his views on the Glacial Period and similar problems, his editorial work, his theological work, the final chapter being 'My Creed,' which begins with the 'Personality of God,' and ends with 'Nations will learn the folly of war.' With his geological observations and his travels we are more particularly interested, and we should like to congratulate Prof. Wright on an entertaining volume; and the list of his publications between 1871 and 1916, which occupies 23 pages, is an indication of his literary activity.

A REGIONAL STUDY.

The Geographical Teacher, No. 57 (pp. 189-252), 2s., is a particularly good number. Among the contents we notice 'The Ordnance Survey and Map Issues'; 'Geography and Classics'; 'Educational work on the School journey'; in addition to which there is an elaborate 'Regional Study of North-East England,' by C. B. Fawcett, in which he informs us, 'Since the close of the last Glacial Period the most important event in the physical history has been a relative elevation of the land, probably to 100 or 150 feet above its previous position. This caused a general rejuvenation of the streams. Rivers which were meandering on the drift which had filled up the bottoms of the older valleys, and re-arranging that material in terraces, were enabled once more to cut downwards towards the new base level. In doing so, they have produced numerous gorges, and many groups of entrenched meanders, of which the loop of the Wear round Durham is the classic example.' This interrupted development has produced a type of valley in which we get the condition that while the main valley is, as in normal cases, a line of travel and a relatively fertile area, the gorge in the bottom is frequently a serious obstacle to transverse communications. Hence the railways and main roads tend to keep along the main valleys well above these narrow and youthful inner valleys, and the number and magnitude of the bridges required is a serious handicap to road development.

MARINE BIOLOGISTS.

Notwithstanding the high cost of printing, etc., the

* 'Story of My Life and Work,' by G. Frederick Wright. Oberlin, Ohio: Bibliotheca Sacra Co., 457 pp.

Journal of the Marine Biological Association (N.S. XII., No. 2), just to hand, is a remarkably substantial, well printed, well illustrated, and well edited publication, and contains some scientific memoirs of unusual merit and value. Besides the Reports, etc., for the year, the part contains 'The Pelagic Young and Early Bottom Stages of Teleosteans,' by R. S. Clark; 'The Post-Larval Stages of Ammodytes Species, Note on a Leptocephalus Stage of the Conger,' and 'The Number of Pyloric Cœca in the Herring,' by E. Ford; 'The Eggs of *Gobius minutus, pictus* and *microps*,' and 'The Food of Young Fish,' by Marie V. Lebour; '*Clavella iadda*, N. Sp.: a Parasitic Copepod of *Gadus morrhua*,' by W. H. Leigh-Sharpe; and 'Sea-Temperature, Breeding and Distribution in Marine Animals,' by J. H. Orton. The Report contains a good list of supporters, but the list of members should be much greater; the subscription is only one guinea a year, and includes the publications free.

ZOOLOGICAL BIBLIOGRAPHY.

Dr. F. A. Bather, Secretary to the Committee of the British Association on Zoological Bibliography and Publication, sends the following recommendations of the Committee, and we should be glad if our contributors would adopt them for the future. In brief articles, references may quite easily be worked into the text, and can be repeated by giving the cited author's name, with a distinguishing date when more than one of his works has been mentioned. This is more economical of time, space, and money than footnotes, and is far less fruitful of error than the irritating *ibid.* and *loc. cit.*, often used by writers who apparently do not know what the contractions really mean.

REFERENCES TO PAPERS.

For long articles or memoirs it is more convenient for both author and reader to have, at the end of the memoir, a 'List of Works referred to' (often erroneously termed a 'Bibliography,' even when lamentably lacking all bibliographic details). This should be arranged with the names of the authors in alphabetical order, and with the papers under each author's name in chronological order, the date of publication (month as well as year, if necessary) preceding the title of the paper. In those rare cases when two or more papers by a single author from a single year cannot be distinguished by the month, the letters *a, b*, etc., may be added. The Committee would repeat two suggestions made in 1897. First that the title of a paper (or at least its opening words)should be quoted as well as the name of the journal from which it is taken. Secondly, that references should be given in full (*i.e.*, series, volume, pages, date), so that an error in one may be corrected by the help of the others.

EVOLUTION OF A COAST LINE.

'The Evolution of a Coast Line,' by Wm. Ashton, Ed. Stanford Ltd., 302 pp., 10s. net. In 1909 Mr. Ashton published 'The Battle of Land and Sea,' the present work is practically an enlarged edition, re-written, and with additional information inserted. The author has gathered together much interesting information respecting the coast changes between Barrow, Aberystwyth, and the Isle of Man, and gives notes on Lost Towns, Submarine Discoveries, etc. By the aid of reproductions from various maps, geological and topographical, he draws attention to the changes which have taken place between prehistoric times and the present day, and in connexion with his story he has made full use of the Coast Erosion Reports, and other sources of information.

A LIVE PHILOSOPHICAL SOCIETY.

The Whitby Literary and Philosophical Society is to be congratulated on the production of its Ninety-seventh Report (66 pages in all), which we believe is the most substantial report it has issued since the Society was founded nearly a century ago. Its income from admissions to the Museum (£66) is the largest amount received in one year since its foundation, and the Society has entered into an agreement for the purchase of the property adjoining the Museum building for extension purposes. Probably this record just now is unique among the Literary and Philosophical Societies in this country. The report contains an interesting 'List of additions'; Some Local Natural History Notes (Birds and Fishes) for 1919, by Mr. F. Snowdon; Meteorological Observations; 'Some (Whitby) Abbey Problems and Discoveries,' by J. W. Barry, and Notes on the Geology of Whitby Sands, by J. T. Sewell.

FIBROUS GYPSUM OF NOTTINGHAM.

At a recent meeting of the Mineralogical Society, Mr. W. A. Richardson read a paper on the 'Fibrous Gypsum of Nottingham.' The relation to the nodular types of gypsum of the fibrous veins of the mineral, which are associated with every other type of gypsum deposit in the district, and occur at levels where there is no other development of the mineral, was considered. Most of these veins are regarded as having been formed shortly after the nodular deposits. The fibres grew upwards and downwards from a plane in the marl, and were probably deposited by descending solutions, being precipitated at planes of tension in a contracting medium. The veins of fibrous calcium carbonate or 'beef' described by Dr. Lang show similar structure and field relations, and doubtless originated under similar conditions.

——: o :——

The death is announced of Dr. Robert Munro, the authority on Scottish Antiquities, in his 85th year.

THE CONGLOMERATES UNDERLYING THE CARBONIFEROUS LIMESTONE IN THE N.W. OF ENGLAND.

J. A. BUTTERFIELD, M.Sc., F.G.S.

(*Continued from page 252*).

The junction at the top is masked by boulder clay, but, as has been stated above, it is most probably a faulted one. Two points seem to bear this out. Firstly, near the junction there are many faulted and striated pebbles similar to those obtainable in other parts close to a fault; and secondly, close to the junction there is a significant change in the dip. It is practically impossible to obtain correct values of dip unless there are interbedded sandy bands, but towards the top of the gill, at the junction, there seems good evidence that the beds dip away from the junction down stream at about 15 degrees for a short distance, when the dip changes upstream and then again downstream, forming a small anticline and syncline as the junction is approached. This contortion near the junction seems very significant.

The assemblage of pebbles is very varied, but chiefly local in origin. It is made up of sandstones, shales, slates, grits, limestones and quartzites with some mica-traps. There are, however, a few which the writer has not been able as yet to ascribe to a satisfactory source. Many of the limestone pebbles contain fossils, but beyond these no fossils, which might help to fix their age, have been found in the deposits. In the compact middle portion a large rounded pebble, 15 ins. diameter, of conglomerate itself, was noted, and this, together with the fact that there are cases of unconformity in the conglomerates suggest erosion contemporaneous with deposition. In many places excavations can be observed that have been made in the conglomerates and then filled in with later conglomerate. Such a state of things is to be expected if these are torrential deposits, for each successive outburst would carve out new gullies, etc., which would be filled in with new material.

(*b*). *Ashbeck and Little Ashbeck Gills*.—The exposures in these two gills are somewhat similar to those in Settlebeck Gill, but by no means so good. In Ashbeck Gill the lowest exposure, just west of Stone Hall, is of fairly fine conglomerate. Upstream the deposit becomes coarser until it resembles the coarse conglomerate of Settlebeck Gill, when, as in the latter, it then becomes finer again. The last exposure, however, near to the junction, is a fairly coarse conglomerate and not the sandy material that forms the junction in Settlebeck Gill. For some distance exposures are covered up by boulder clay, but the underlying rocks are exposed about 200 yards above the farm. There are very few exposures in Little

Ashbeck Gill, but the junction can be settled fairly closely, and the conglomerate at the junction is the coarse variety with pebbles up to 12 in. diameter. Ashbeck Gill shows the same transition from fine to coarse and back again as was noted in Settlebeck Gill, and the two gills give, perhaps, extra evidence of the fault, for whereas in Settlebeck Gill the rock exposed at the junction is practically a sandstone, in Ashbeck Gill it is a fairly coarse conglomerate, and in Little Ashbeck Gill it is a coarse conglomerate.

(2). The Rawthey.—In the bed of the Rawthey, under Straight Bridge, a coarse conglomerate is exposed, the pebbles reaching 2 ft. across. It is similar in appearance and general composition to the coarse conglomerate of Settlebeck Gill. There are many crushed, faulted, striated and indented pebbles, and much calcite is present. A good collection of fossils from the pebbles was obtained at this spot; they are, of course, only derived fossils, and therefore indicate little regarding the age of the conglomerates. In Buckbank Woods, further upstream, a sandy phase is developed, and a little higher up, at Rake's Ford, the steep banks of the river are composed of interbedded sandstones and fine conglomerates. As will be seen from the sketch map, one arm of the conglomerate at this point is faulted down the middle, there are three unconformable junctions, and the underlying rocks are exposed for about 150 yards in the bed of the river.

(3). Hebblethwaite, Nor and Pennyfarm Gills.—(*a*). The road from Sedbergh to Kirkby Stephen crosses *Hebblethwaite Gill* just before it enters the Rawthey, and under the bridge fairly coarse conglomerates are exposed. From this point the conglomerates, at first, dip about 5 degrees upstream, then become nearly horizontal. In this gill, towards the bottom, there are some splendid workable sections of conglomerate with pebbles up to 2 ft. across. A little further upstream an old building and waterfall mark the faulted junction between the conglomerates and older rocks, and for about 250 yards the stream flows over Coniston Flags. At the end of this a fault brings in Pale Slates, and these are again replaced by Coniston Flags further upstream. South-east of Hebblethwaite Hall the conglomerates again come in, the junction being an unconformable one. Here again it is a coarse compact conglomerate dipping 45 degrees S.E. Further upstream a thick band of sandstone comes in, and above this the conglomerate is much finer and less compact. Sixty yards below the junction with Nor Gill this fine conglomerate is interbedded with numerous thin sandy bands steeply inclined (about 60 degrees S.E.). At the junction with Nor Gill the conglomerate is fairly coarse and the arrangement of the pebbles seems to suggest the beds to be nearly

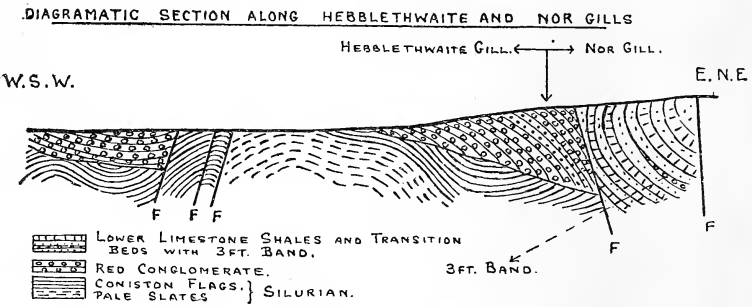
perpendicular. It may be that the pebbles which in many cases are long and flat have taken up this position owing to pressure. The dip, however, appears to be very steep here, and conforms somewhat to that of the limestone beds above. There is a splendid workable section about 20 ft. high at this point.

(*b*). *Nor Gill.*—At the bottom of this beck is the most critical section in the Sedbergh area, for here is a junction between the Conglomerates and the Lower Limestone Shales (Carboniferous) which suggest to the writer evidence of transition from the red conglomerates into the shales and limestone. It is, however, a difficult section and requires careful study. At the junction of Hebblethwaite Gill and Nor Gill a fairly coarse red conglomerate (pebbles up to 15 in.) is exposed apparently dipping very steeply, and becoming, close to the fault, practically vertical. There is then a gap which probably marks a fault, and above it is the following interesting section :—

Light green calcareous grit passing upwards into shales and limestones.	
Calcareous breccia	3 ft.
Light green sandstone	18 ins.
Red sandstone	2 ft.
Red Conglomerate	3 ft.
Deep red sandstone	3 ins.
Grit—Top half light coloured shading into bottom half red	9 ins.
Red sandstone	6 ins.
Reddish grit	4 ins.
Dark red sandstone merging downwards into light coloured grits and shales ...	30 ft.
———— Fault ————	
Coarse red conglomerate.	

The beds in the above section are all practically vertical, and, just above, the limestone beds show cases of overturning. There has, therefore, been much pressure and consequent movement which only tends to make the matter more difficult. There is, however, some evidence of transition. The occurrence of the 3 ft. band of conglomerate in the middle of the section is interesting. The conglomerate up to the fault is fairly coarse and flaky, with pebbles rounded and sub-angular. This 3 ft. band, however, is extremely hard and compact and the constituent pebbles very small and well rounded. It is quite different, in most respects, from the conglomerate below the fault, and seems to suggest a short temporary return to conglomeratic conditions in the midst of this transitory period of relative quiescence. A rather curious point arises,

as in Pennyfarm Gill, a parallel sister stream, only about 150 yards away, this 3 ft. band is not exposed. Apparently it has been squeezed out, the tip of the wedge appearing in Nor Gill, but not being reached by the stream in Pennyfarm Gill. This suggestion seems to be supported (1) by the great development of calcite in the 3 ft. band, and (2) by the fact that the band of conglomerate seems to taper out up the hill-



side in Nor Gill. The accompanying sect on, perhaps, explains this better.

(4). Hole Beck, Clough River and Dove Cote Gill.—(*a*). The exposure in *Hole Beck* gives a practically continuous section of conglomerate, lying unconformably on the older rocks at its northern end and faulted at its southern end. It is chiefly of interest because of the abundance of faulted and striated pebbles, etc.,* to be found there, due to the movement caused by the Dent Fault. It is very coarse in places and there are large boulders as much as 3 ft. across. The assortment is very similar to that found in the coarse portions in other gills.

(*b*). At Sparram Ford (*Clough River*) the conglomerate makes a cliff about 15 ft. high and continues upstream about 100 yards, when the river cuts a narrow gorge through limestone.

(*c*). There is a splendid section in *Dov Cote Gill* just below the farm, where the stream cuts a gorge and displays a fairly coarse conglomerate dipping steeply south-west and forming a picturesque waterfall.

In the preceding notes the writer has attempted merely to outline the distribution of these deposits in the Sedbergh area, and suggest one or two of the problems. The two best sections for working are those in Settlebeck Gill and Hebblethwaite and Nor Gills.

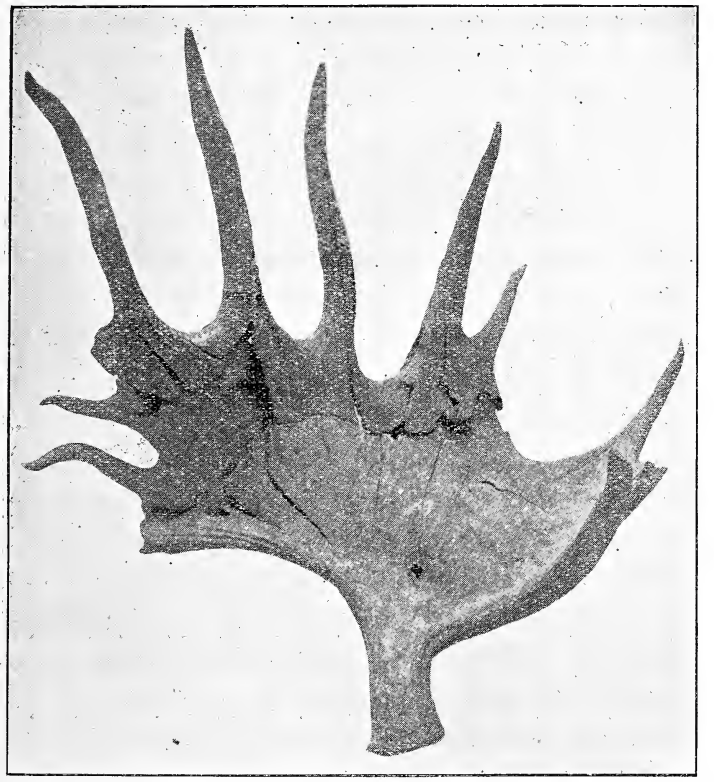
(*To be continued*).

* "The Effect of Pressure on a Conglomerate in Hole Beck, Sedbergh," J. A. Butterfield, *The Naturalist*, p. 191.

REMAINS OF THE ELK, ETC., IN EAST YORKSHIRE.

T. SHEPPARD, M.Sc., F.G.S.

From the collection of the late Thomas Boynton, F.S.A., of Bridlington, the Hull Municipal Museums have secured a



Antler of Elk from Barmston, E. Yorks.

number of interesting objects, including all the remains of local extinct mammals which he had. Principal among these is a left shed antler of an extinct Elk, *Alces machlis*, shown in the accompanying illustration. This antler decorated the hall of the 'Norman House,' Bridlington, in which position it has long been known to the writer. It is nearly complete, and has been repaired at the back by a number of plates of iron, upon which the broken fragments have been

1920 Sept. 1

secured by screws. There are ten tines remaining, originally there were more. The two small ones shown together at the bottom of the block are not in place, but should be joined on the extreme point of the base of the antler. The piece has been put in its present position in order to bridge a gap and strengthen the object.

The measurements are, from the longest tine to the base of the shaft in a straight line, 2 ft. 4 in., or, measuring along the tine, 2 ft. 9 in. The brow tine, measured along its length, is 2 ft., and the greatest width of the antler, 2 ft. 3 in., the shaft being $9\frac{1}{2}$ ins. in circumference at the junction of the skull, and $7\frac{1}{4}$ ins. at a distance of $2\frac{1}{2}$ ins. therefrom.

On the back, in Mr. Boynton's writing, is a label reading : ' Antler of the Elk *Cervus alces* found in the cliff at Barmston by Alex. Bosville, Esqr., Thorpe Hall, 1839, and presented to me by the Rev. C. Hudson, 1890. Thos. Boynton.'

I understand from Mr. G. W. Lamplugh, F.R.S., that about 35 years ago Mr. Boynton made some excavations in the district in the hope of finding more remains of an animal of this species, but as the digging was in a field between Hilderthorpe and Bessingby, I think it would not be in search of remains of this particular animal, as in this case the antler, being cast, would probably not be accompanied by any other bones. Besides, our specimen was found in the cliff at Barmston in 1839.

In a paper on ' Remarks on the Extinct Fauna of the East Riding of Yorkshire,' by ' Edward Tindall, of Bridlington,' printed in Vol. V. of the *Proceedings of the Geological and Polytechnic Society of the West Riding of Yorkshire*, 1869, are two further East Yorkshire records of this species, both of them, oddly enough, being found in the Bridlington district, one so long ago as 1822, the other in 1868. There is just a bare possibility that the specimen now described may be one of these two examples, but as in each case the date and locality differ from those given by Mr. Boynton, it looks very much as though we have three distinct records of antlers of *Alces machlis*, all near to Bridlington, all made many years ago ; and strangely enough no further records of this species in the district appear to have been made since.

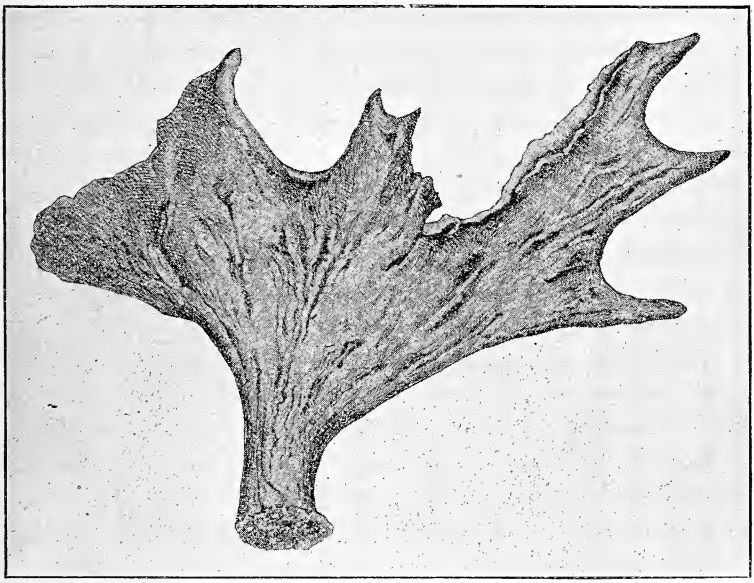
A recent description of a cast antler* is given in the *Transactions and Proceedings of the Perthshire Society of Natural Science*, Vol. VI., Part 4, 1917, pp. clix-clxi., though in that particular instance, also, it is not a recent discovery, but was found at Methven so long ago as 1801.

In A. Smith Woodward and C. Davies Sherborn's ' Catalogue of British Fossil Vertebrata,' 1890, p. 312, details of

* The illustration of this example was reproduced in *The Naturalist* for 1918, page 113.

British records are given. These are remarkably few, and none of them are recent. It seems remarkable that with all the excavations in the Northern Counties in recent years not a single record of this species has been made.

The following is the reference to the Elk remains appearing in Tindall's paper already referred to. 'The second animal whose remains I have to record as a former inhabitant of Yorkshire is the Elk or Moose Deer (*Alces malchis*) (*sic*), which has occurred in two instances. In the spring of 1822, as some workmen in the employ of Messrs G. and W. Tindall,



Elk Antler found at Chirdon Burn, North Tyne (from *Trans. Tyneside Nat. Hist. Club*, 1861).

nursery and landscape gardeners, of Beverley, were employed in digging out some drift gravel to construct a lake at Thorp Hall, near Bridlington, the seat of Lord Macdonald, they found at the depth of about four feet and a half from the surface, some of the bones and the horns of the Elk (the largest of the Cervine family which still exists on the surface of the globe), and also a fine horn of the Stag or Red Deer ; and in the month of February, 1868, a horn and the occipital portion of the skull of a female specimen of the Elk were found during the process of draining, in a peat bog, about two feet below the surface, on the property of Sir George Cholmley, at Carnaby, near Bridlington ; and it is very probable the remaining parts of

the skeleton of one of these animals may still be entombed in the same locality. Although the bones of this noble animal are said to have been found in different parts of the kingdom, the first authentic instance is in the *Transactions of the Tyneside Natural History Club* for 1861, Vol. V., Part II, p. III, which contains a paper on the discovery of a fine shed horn [antler] of the Moose Deer or true Elk at Chirdon Burn, North Tyne, near the bottom of a peat formation, resting partially on the coarse gritty marl formed by the weathering of the subjacent strata.'

From this description it seems clear that ours is a third local example, and that the excavations made by the late Thos. Boynton, at Carnaby would be in the hope of finding more remains of the animal originally discovered in 1868.

I have tried to trace the present whereabouts of the other recorded antlers, but so far have failed. Mr. W. Watson informs me they are not in the York Museum, and likely places in the East Riding have not produced them.

In addition to this antler, the Boynton collection includes many fine antlers of the Red Deer, *Cervus elaphus*, a skull of *Bos*, and two pieces of a tusk of an Elephant, probably *Elephas primigenius*. As these are from some localities not previously recorded, particulars are given below :—

Red Deer, from Watermill Beck, Bessingby, left antler complete, measures 2 ft. 8 in. from base to top ; seven tines.

Portion of Skull and portion of left antler measuring 2 ft. 7 in., found when draining High Ousegate, York.

Broken left antler from Wawne, measures 1 ft. 2 in.

Portion of antler measuring 1 ft. 9 in. No locality.

Portion of antler, Barugh Hill, Gransmoor, 1 ft. 3 in. ; three tines ; left antler.

Part of right antler, 1 ft. 9 in., from same locality.

Bos primigenius, skull, from Frodingham, Holderness. Measures 2 ft. 1 in. from tip to tip of horn-cores.

Bos primigenius, horn core, from Wawne, measures 1 ft. 9 in. long.

Another, no locality, measures 2 ft. long.

Portion of tusk of Elephant from the Gravel Pit, Catwick, measures 1 ft. long and has a diameter of 11 ins.

——: o :——

Plusia moneta in Wharfedale.—Quite recently a specimen of *P. moneta* was shown to me by Mr. F. Rhodes at the Cartwright Hall. It had been found by Sir Arthur Godwin in the larva stage, in his garden at Grassington, feeding on *Delphinium* ; thus another stage in its northern distribution. —J. W. CARTER, Bradford.

Naturalist,

A GUIDE TO THE GENERA OF BRITISH AGARICACEAE

HAROLD WAGER, D.Sc., F.R.S.

The classification of the Agaricaceae presents serious difficulties owing to the lack of morphological differentiation, and to the large amount of variation which occurs in the group. In the determination of both genera and species many characters which hardly seem to be of sufficient generic or specific importance have to be taken into account, such as colour, smell, taste, size, tendency to putrify or deliquesce. Many genera and species can only be made out by a careful summation of morphological and physical characters and frequently only after a careful microscopical examination of spores, cystidia and basidia.

The following tables have been compiled as aids to students and beginners generally in the study of the genera of the Agaricaceae. Table I. is a schedule of the principal characters likely to be present, and will serve as a guide to the examination and description of the specimens collected. Table II. is a key to the genera. Table III. contains a summary of the chief sub-families in which the genera may be grouped, and Table IV. will be found useful as a preliminary guide to the determination of the genera in the field.

For the determination of species reference may be made to Massee's ' British Fungus Flora,' and to his ' British Fungi and Lichens ' ; to W. G. Smith's ' British Basidiomycetes ' ; to the ' Nouvelle Flore des Champignons,' par Constantin et Dufour ; and to ' A Key to the British Agaricineae,' by H. J. Wheldon.

TABLE I.

Schedule of Characters.

Season of year when found, date.

Habitat : this should be carefully noted.

General Form and Texture : fleshy, membraneous, leathery, hard or soft, tough or brittle : presence of volva, ring, cortine : taste, smell : presence of milky fluid : putrescent or deliquescent, or drying up without perishing.

Pileus : colour, shape, size, texture : surface smooth, scaly, fibrous, silky, slimy, viscid, hygrophanus or dry.

Gills : free, adnate, adnexed, sinuate, decurrent : equal or unequal, branched or simple : edges acute, obtuse, channelled, serrate, denticulate : colour of gills and spores.

Stem : central, lateral or absent : size : solid, hollow, or stuffed : fleshy, cartilaginous, tough : smooth, scaly, fibrous, silky, slimy, viscid : simple or with volva ring or cortine.

Spores : colour, size, shape, smooth or rough.

1920 Sept. 1

TABLE II.

Key to Agaricaceae.

1. Stem central... 2
1. Stem excentric, lateral or absent 75
2. Volva, ring or cortine present 3
2. Stem simple, no volva, ring or cortine 36
3. Volva or ring, or both present 4
3. Cortine only present 26
4. Volva and ring present ... ... **Amanita**
4. Volva or ring only present 5
5. Volva only present 6
5. Ring only present 7
6. Spores white ... ... **Amanitopsis**
6. Spores pink ... ... **Volvaria**
6. Spores ocraceous ... ... **Acetabularia**
6. Spores black ... ... **Coprinus**
(Volva sometimes appears as a ring.)
7. Gills white or of a pale yellowish colour 8
7. Gills coloured 11
8. Cap covered with scales or patches of the volva, independent of the cuticle ... ... **Amanita**
8. Cap smooth, or with scales arising from excoriation ... 9
9. Gills free ... ... **Lepiota**
9. Gills attached to stem 10
10. Stem separating easily from cap ... ... **Lepiota**
10. Stem not easily separated from cap, gills sinuate, adnate or decurrent ... ... **Armillaria**
11. Gills pink or rose colour 12
11. Gills, some other colour, usually yellow, rusty, brown, purple or black 15
12. Cap with scales or patches, independent of the epidermis ... ... **Amanita** (*A. rubescens*)
12. Cap smooth or with epiderminal scales not free from the cuticle 13
13. Gills free, grey, rose or pink at first, then purple or brown or brownish-black ... ... **Psalliota**
13. Gills attached to stem 14
14. Spores white ... ... **Lepiota**
14. Spores purple, gills becoming purple ... **Stropharia**
15. Gills becoming black, white or slightly pink, when young. Fungus deliquescent by auto-digestion : spores black ... ... **Coprinus**
15. Fungus not deliquescent 16
16. Gills free 17
16. Gills attached to stem 21
17. Gills white, yellowish, cream or grey or salmon 18
17. Gills grey-rose, becoming purple or black, or yellow-brown : spores not white 19
18. Gills very pale : spores white ... ... **Lepiota**
18. Gills whitish yellow or yellow, spores ocraceous, **Pholiota**
18. Gills white, then salmon : spores pink ... **Annularia**
19. Spores purple, purple-brown or dark purple 20
19. Spores ocraceous ; gills yellow, brown or cinnamon **Pholiota**
20. Spores purple or purple-brown : gills free **Psalliota**
20. Spores purple or purple-black : gills usually more or less adnate, sometimes free or nearly so, **Stropharia**
21. Spores white : gills white, pale cream, straw coloured or reddish 22

21. Spores coloured : gills yellow grey-violet, brown-purple, brown or black 23
22. Gills white to cream or straw colour : stem easily separating from pileus ... ... **Lepiota**
22. Gills white to yellowish, or becoming reddish brown : stem not easily separating from pileus **Armillaria**
23. Spores black ... ... **Annularia**
23. Spores purple-brown 24
23. Spores ocraceous 25
24. Ring well formed, permanent : gills grey-violet or purple-brown : pileus often viscid ... ... **Stropharia**
24. Ring imperfect, cortine like, evanescent : gills yellow with a tinge of purple or olive-green **Hypholoma**
25. Ring present, distinct, membranous, without a cortine : Fungi growing in tufts, on wood, or singly on ground ... ... **Pholiota**
25. In addition to an imperfect ring, which may be present, there is a cortine connecting the edge of the cap to the stem ... ... **Cortinarius**
26. Spores white : gills white to yellow 27
26. Gills and spores coloured 29
27. Gills free : ring fugacious, like a cortine ... **Lepiota** (*L. clypeoraria*)
27. Gills sinuato-adnexed 28
28. Gills white to yellow : stem bulbous at base : arachnoid veil present ... ... **Armillaria** (*A. bulbifera*)
28. Gills white : stem not bulbous : arachnoid veil present in young state ... ... **Tricholoma** (*T. terreum*)
29. Gills coloured, decurrent : spores dingy olive to black. Imperfect floccose ring or cortine on stem ... **Gomphidius**
29. Gills not decurrent 30
30. Fungi solitary 31
30. Fungi in tufts 35
31. Gills yellow, ocraceous, reddish or cinnamon : spores ocraceous 32
31. Gills and spores purple or purple-brown ... **Hypholoma**
32. Gills rusty, cinnamon or reddish : cortine distinct on stem, and of a rusty colour ... **Cortinarius**
32. Cortine not rusty ; fugaceous 33
33. Pileus scaly or fibrillose ; often splitting radially : gills brown, spores ocraceous : veil sometimes cortinate forming an ill-defined ring on stem ... **Inocybe**
33. Pileus not scaly or fibrillose : gills not brown 34
34. Gills violet or cream, with tinge of violet, changing to cinnamon ... ...**Cortinarius**
34. Gills whitish flesh or tan, not changing colour : margin of gills cortinate or with imperfect silky-floccose ring on stem ... ... **Hebeloma**
35. Gills ocraceous or cinnamon : spores ocraceous **Flammula**
35. Gills brown or deep brown : spores purple-brown **Hypholoma**
36. Fungi tough, pliant, coriaceous or woody 37
36. Fungi fleshy or deliquescent 40
37. Gills with edge acute 38
37. Gills with edge obtuse, adnate, decurrent, broadly fold-like, dichotomous : spores white. A doubtful genus ... ... **Xerotus**

38. Fungi not putrescent or deliquescent, drying up without perishing. Pileus fleshy pliant, or membranous. Gills usually adnate, sometimes free or nearly so, or attached to a collar, or sub-decurrent: somewhat distant, variously coloured, not denticulate, spores white: stem cartilaginous or horny, central ... ... **Marasmius**

38. Pileus fleshy coriaceous: stem usually lateral or none, very rarely central: spores white 39

38. Gills decurrent: spores black ... **Gomphidius**

39. Pileus pliant or hard: stem hard, central lateral or absent: gills decurrent, sinuato-decurrent or sub-decurrent, edge acute, often serrate, denticulate, crenate or irregular, white or pale yellow, rose or brown: spores white ... ... **Lentinus**

39. Pileus fibrous, coriaceous: stem excentric, lateral or none: gills not serrate, edge acute, decurrent, adnate or adnexed, whitish-pink or pale yellow: spores white ... ... **Panus**

40. Fungi deliquescent or sub-deliquescent 41

40. Fungi fleshy, membranous or coriaceous, not deliquescent 42

41. Fungus deliquescent (by auto-digestion): gills white or pink when young, black at maturity: spores black: stem hollow ... ... **Coprinus**

41. Fungus sub-deliquescent (not auto-digested), very fragile and delicate: gills yellowish or orange: spores ocraceous ... ... **Bolbitius**

42. Gills free 43

42. Gills attached to stem 45

43. Spores white: gills white ... ... **Schulzeria**

43. Spores green ... ...**Chlorospora**

43. Spores pink ... ... **Pluteus**

43. Spores oraceous 44

43. Spores purple-brown or purple ... ... **Pilosace** (One species only)

43. Spores black: gills free or on a collar ... ... **Coprinus**

44. Fungus deliquescent (not auto-digested): pileus thin, striate or not, yellow, brown or grey: gills yellow or orange, pale reddish or brown: stem slender, fragile, separating easily from cap, white or yellow, hollow: on dung or manured ground **Bolbitius**

44. Pileus slightly fleshy, viscid, margin striate (at first straight and adpressed to stem), conical or campanulate, gills yellowish or cinnamon: stem hollow ... ... **Pluteolus**

45. Gills adnexed, adnate or sinuate 46

45. Gills decurrent 66

46. Gills sinuate 47

46. Gills adnexed or adnate 52

47. Margin of pileus incurved at least when young 48

47. Margin of pileus straight, not incurved, adpressed to stem when young 51

48. Spores white ... ... **Tricholoma**

48. Spores pink ... ... **Entoloma**

48. Spores ocraceous 49

48. Spores purple-brown or purple 50

49. Pileus squamulose or fibrillose ... ... **Inocybe**

49. Pileus smooth, more or less viscid, not squamulose or fibrillose ... ... **Hebeloma**

50. Gills brown with purple tinge, usually adnate, rarely sinuate : edge of pileus often with fringe **Hypholoma**
50. Pileus smooth, no fringe : gills rarely sinuate, usually adnate ... ... **Psilocybe**
51. Spores white : stem hollow, cartilaginous ... **Mycena**
51. Spores pink : stem hollow or stuffed, cartilaginous, **Nolanea**
52. Spores white 53
52. Spores coloured 59
53. Gills thick 54
53. Gills thin 55
54. Parasitic on other fungi : gill edge obtuse **Nyctalis**
54. Gills thick, fleshy waxy, edge acute **Hygrophorus**
55. Gills rigid, fragile, breaking easily 56
55. Gills pliant 57
56. All parts exuding a milky or coloured fluid when broken ... ... **Lactarius**
56. Fungus rigid, but very fragile and brittle, no milky or coloured juice ... ... **Russula**
57. Margin of pileus incurved, at least when young **Collybia**
57. Margin of pileus straight or recurved, adpressed to stem when young ... ... **Mycena**
58. Spores coloured : edge of cap incurved 59
58. Spores coloured : edge of cap straight, adpressed to stem when young 65
59. Spores pink 60
59. Spores ocraceous 61
59. Spores purple-brown or purple 64
59. Spores black : margin of pileus exceeding the gills **Panaeolus**
60. Gills usually decurrent : stem fleshy or fibrous, not cartilaginous : spores pink ... ... **Clitopilus**
60. Stem cartilaginous, more or less polished : spores pink ... ... **Leptonia**
61. Stem solid, fleshy and fibrous externally : spores ocraceous 62
61. Stem hollow or stuffed, cartilaginous : spores ocraceous **Naucoria**
62. Pileus scaly or fibrillose : spores ocraceous ... **Inocybe**
62. Pileus smooth viscid, glabrous 63
63. Fungi terrestrial : spores ocraceous ... ... **Hebeloma**
63. Fungi growing on wood : spores ocraceous ... **Flammula**
64. Pileus smooth, stem cartilaginous : spores purple **Psilocybe**
64. Pileus fleshy, margin at first incurved : veil often remaining as a fringe on margin of pileus : stem fleshy : spores purple ... ... **Hypholoma**
65. Spores pink ... ... **Nolanea**
65. Spores ocraceous ... ... **Galera**
65. Spores purple ... ... **Psathyra**
65. Spores black ... ... **Psathyrella**
66. Spores white 67
66. Spores pink 71
66. Spores ocraceous 72
66. Spores purple : gills adnato-decurrent ... **Psilocybe**
66. Spores black ... ...**Gomphidius**
67. Fungus exuding a milky or coloured fluid when broken **Lactarius**
67. Gills thick, fleshy waxy or waxy 68
67. Gills thin, pliant 69
68. Gills thick, waxy or fleshy waxy, often branched edges acute ... ... **Hygrophorus**

68. Gills thick, somewhat branched, fold-like, narrow, edge obtuse ... ... **Cantherellus**

69. Pileus fleshy, margin involute : stem fleshy, not cartilaginous, sometimes hollow or stuffed 70

69. Pileus more or less membranous, margin straight or deflexed : stem cartilaginous, hollow or stuffed **Omphalia**

70. Pileus plano-depressed or infundibuliform : gills white to cream, yellowish or yellow-green : stem fibrous and fragile : spores elliptical or subglobose, smooth ... ... **Clitocybe**

70. Pileus convex, then depressed or umbilicate, thin : gills adnato-decurrent or broadly adnate : spores globose-warted ... ... **Laccaria**

71. Pileus more or less depressed or umbilicate : stem fleshy, fibrous, solid, hollow or stuffed : gills deeply decurrent or adnato-decurrent ... ... **Clitopilus**

71. Pileus somewhat membranous, thin, usually umbilicate : stem hollow, cartilaginous : gills decurrent **Eccilia**

72. Pileus thin or sub-membranous : spores ocraceous ... 73

72. Pileus fleshy : spores ocraceous 74

73. Pileus thin, silky, scaly or fibrillose, margin often fringed with arachnoid veil : stem fleshy, not cartilaginous, scaly, fibrillose or smooth ... **Inocybe**

73. Pileus sub-membranous, sometimes umbilicate or depressed, margin more or less striate, sometimes with remains of white squamulose veil : stem cartilaginous, hollow ... ... **Tubaria**

74. Margin of pileus at first involute : pileus bright yellow orange, or orange-brown, viscid, humid or scaly : stem fleshy : gills decurrent or adnate : species usually growing on wood ... **Flammula**

74. Margin of pileus usually persistently involute : pileus whitish yellow, tan colour or reddish-brown : gills decurrent, often anastomosing behind, near stem : spores dirty white or brown : gills separating easily from pileus : stem fleshy ... ... **Paxillus**

(*To be continued.*)

——: o :——

Some British Birds. A book for boys and girls. Edinburgh : Chambers, 64 pp., 2/6 net. Without title page, name of author, dedication or anything else, this volume begins with an account of the Woodpecker, and deals with the Cuckoo, Magpie, Nightingale, Owl, Rook, Chaffinch and other well known species. The chapters are specially prepared for young readers, large type and no long words being used. There are numerous coloured plates and other illustrations, the former being exceptionally good for a work of this kind.

Birdsnesting, by **J. G. Black.** Newcastle : Andrew Reid & Co., 240 pp., 4/6 net. The author addresses letters to the critic, asking him to imagine himself a boy again, to Father or Mother apologising for leading boys into mischief, and to the Boys, offering them 5/- if they find anything stated as a fact that isn't true. The author certainly gives practical hints on birds-nesting, and describes the various species under the headings of Birds, Haunts, Nests, Eggs, Season, Hints, etc. He evidently is a practical man and knows his subject thoroughly. Whether, however, it is advisable in these times to publish a book on Birdsnesting, when the law is distinctly against that particular hobby, is another matter.

THE SPIDERS OF YORKSHIRE.

WM. FALCONER, F.E.S.
Slaithwaite, Huddersfield.

(Continued from page 206).

Leptyphantes tenuis Bl.*
Common and generally distributed in the British Isles and on the Continent, extending also to the Azores; in a variety of situations. *Adults* throughout the year. First occurrence—the author, Slaithwaite, June, 1898. Less abundant than *L. zimmermannii* Bertk. in the county, but as widely dispersed, the recorded stations being numerous in V.C. 61, 62, 63, 64.

L. ericæus Bl. (includes *L. inconspicua* Camb.).
Plentiful in the north of England and in Scotland, but rare in the south and in Ireland; Isle of Man, 1908; not yet noticed on the Continent; under stones and amongst herbage and fallen leaves. *Adults* throughout the year. First record—R. H. Meade, Bingley Moor, October, 1852, S.G.B.I. sub. *Linyphia ericæa* Bl.
V.C. 61, 63, 64, widely dispersed and recorded stations numerous.
V.C. 62.—Middlesbrough district, 'common everywhere,' J.W.H.; Scarborough, Cayton Lane, Raincliff Woods and Ringingkeld Bog, R.A.T.; Boosbeck, Saltburn, Marske.
V.C. 65.—Y.N.U., Swaledale, W.P.W.; Y.N.U., Upper Teesdale.

L. angulatus Camb.
Very rare, Northumberland and Cheviots and Cumberland (Bow Fell); a mountain species. First occurrence—the author, Malham Tarn, June, 1910.
V.C. 64.—Ingleborough, one ♀, W.P.W.; Malham Tarn, two ♀s, elevation 1,250 feet.

L. mengii Kulcz.
Common in many places as far north as Forres, in Scotland, but probably passed over sometimes as small *L. tenuis* Bl.; abroad, Germany, Austria, Hungary and the Tyrol. *Adult* throughout the year; amongst grass and other herbage and fallen leaves. First occurrence—the author, Drop Clough, June, 1900.
V.C. 61.—Bielsbeck, T.S.; Humber bank, near Skeffling.
V.C. 62.—Cleveland, every locality visited, abundant, J.W.H.; Eston.
V.C. 63.—Bingley Woods, R.B., W.P.W.; Harden, W.P.W.; Deffer Wood; Hebden Bridge and Crimsworth Dene; Bottoms Wood, Ainley Place, Royal Clough, Wholestone Moor, Dean Head, all near Slaithwaite; Drop Clough and Wessenden Valley (Marsden); Saddleworth; Wilshaw (Meltham); Butternab Wood (Huddersfield); Gunthwaite.
V.C. 64.—Ilkley, W.R.B.; Baildon Green, W.P.W.; Shadwell, near Leeds.

L. tenebricola Wid.
Not a very common spider, Dorset, Essex, Norfolk, Cheshire, Lincolnshire, Staffordshire, Lancashire, Northumberland, Cumberland and from four Scottish localities as far north as the Grampians but not yet in Ireland; abroad, Sweden and the countries of Central Europe; amongst grass and fallen leaves. *Adult* in May and June. First occurrence—the author, Stubbing Moor, June, 1905.
V.C. 61.—South Cave, one ♂, E.A.P.; Houghton Woods, one ♂, T.S.
V.C. 62.—Linthorpe, one ♂, three ♀s, Eston Moor, J.W.H.

* In New Zealand introduced by means of eggsacs amongst imported European hay seeds.—*Ann. Soc. Ent. de France*, Vol. LXXXVI.—année, 1917.

V.C. 63.—Stubbing Moor, few of each sex.
V.C. 64.—Elam Wood, near Keighley, one ♂, W.P.W. ; Grass Woods, few of each sex ; Spa Gill Bottoms and near Stephenson Bridge (Sawley).
V.C. 65.—Mickleton, two ♂s. W.P.W.

Gen. *Hillhousia* F.O.P.Cb., 1-1.

H. misera Camb. (*Leptyphantes miser* Camb.).
A rare spider noted for Dorset, Cheshire, Cumberland, Northumberland, Scotland (Dumfries) and Glamorgan. Not the same species as that in *Arachnides de France, tom,* V. p. 321. *Adult* autumn to spring. First occurrence—the author, Chew Valley, October, 1906.
V.C. 61.—Skipwith Common, three ♂s, three ♀s, W.P.W., W.F., ; Riccall Common, many.
V.C. 62.—Lonsdale, one ♀, G.B.W. ; Lonsdale, Farndale, Great Ayton and Eston Moors, quite common, J.W.H.
V.C. 63.—Chew Valley, Greenfield, several ♂s and ♀s from sphagnum, near the ford ; top of Standedge.
V.C. 64.—Sawley High Moor (Ripon), both sexes, S.M., W.F.

Gen. *Drapetisca* Menge, 1-1.

D. socialis Sund.
Not uncommon and widely distributed in the British Isles and on the Continent, also North America ; swift in its movements and difficult of detection as its coloration harmonises with the tints of the tree trunks over which it wanders ; towards winter ♀s may be found amongst the leaves which accumulate in the hollows between the roots of trees. *Adult* autumn. First occurrence—the author, Slaithwaite, September, 1897.
V.C. 61.—South Cave district and Brough, common on beech trees, T.S., E.A.P. ; Houghton Woods, T.S.
V.C. 62.—Wilton Wood, common, J.W.H. ; Newton Moor, W.P.W. ; Raincliff Woods, R.A.T. ; Hayburn Wyke.
V.C. 63.—Often on birch and sycamore, Cottingley, Harden, Bingley, woods at Shipley and Saltaire, W.P.W. ; Calverley, S.M. ; Heaton Woods, T. Str. ; Crimsworth Dene, W.P.W., W.F. ; Bentley Springs (Flockton) ; woods about Huddersfield and in the valleys which radiate from it ; Hebden Bridge.
V.C. 64.—Bishop Wood, T.S. ; Adel dam and King Wood ; Meanwood (Leeds) ; Wothersome ; Bolton Woods.

Gen. *Labulla* Sim., 1-1.

L. thoracica Wid.
Widely distributed in the British Isles and on the Continent ; usually a common spider partial to moist overhanging banks, among grass and low vegetation or fallen leaves. *Adult* late summer and autumn. First occurrence—the author, Slaithwaite, May, 1897.
V.C. 62.—Does not appear on Mr. Harrison's lists for Middlesbrough and Cleveland ; Kildale Woods, Egton and Falling Foss, W.P.W. ; Raincliff Woods, Hayburn Wyke ; Levisham, Goathland ; Kilton Woods, Saltburn, Marske, Lazenby.
V.C. 63, 64.—Widely distributed and stations numerous.

Gen. *Linyphia* Latr., 8-10.

L. insignis Bl.
A spider of northern range in Europe, Asia and America ; in more southern countries found in mountainous districts ; widely distributed in the British Isles, but common only in the North of England and in Scotland ; beaten from trees and bushes in woods

and in situations on the ground. *Adult* in September and October. First record—R. H. Meade, Bradford, 1851-2, S.G.B.I.

V.C. 61.—Saltend Common and South Cave, E.A.P.; Skidby, Bielsbeck, Bridlington, Houghton Woods, T.S.; Scampston.

V.C. 62, 63, 64.—Widely diffused, and stations numerous.

L. montana Clerck.

Usually common and widely distributed in the British Isles, Europe and Siberia; beaten from bushes and branches of trees. *Adult* May to July. First occurrence—? the author, Leeds, December, 1897. Widely distributed in the county, but apparently not so numerous as might have been expected in some parts, *e.g.*, in the Huddersfield area, only one ♀ has so far been taken, viz., Honley Old Wood, W.P.W.,; and the Middlesbrough district, Gunnergate, J.W.H.; Marton, G.B.W.; it is, however, well represented in other parts of V.C. 62 and 63.

L. triangularis Clerck.

An abundant and widely distributed spider throughout the British Isles and Europe, extending also to Siberia; amongst low vegetation and grass and on hedges and bushes. *Adult* late summer and autumn. First occurrence—? the author, Drop Clough, July, 1897. Very widely diffused through the county and plentiful. Mr. Harrison reports it as very sparingly represented in the Middlesbrough district, but it has occurred to other collectors in other parts of V.C. 62 freely.

L. peltata Wid.

A common and widely distributed species in Gt. Britain, extending north to Sutherland, but local in Ireland; abroad, Sweden, West and Central Europe; bushes and branches of trees; sometimes amongst fallen leaves. *Adult* May to July. First occurrence—? the author, Slaithwaite, June, 1897. Widely distributed throughout the county, and plentiful; stations numerous.

L. impigra Camb.

Very local in distribution, the South of England, Staffordshire and Lincolnshire, but often abundant where it occurs. I have not seen this spider but it was named by the Rev. O. P. Cambridge.

V.C. 61.—Hornsea Mere, Y.N.U., both sexes, June, 1908, T.S.

L. pusilla Sund.

With an extensive range in the British Isles and abroad, extending to Siberia and North America; amongst herbage. *Adult* ♂ May to July, ♀ throughout the summer. First occurrence—T. Stainforth, Sutton Drain, May, 1908.

V.C. 61.—Sutton Drain, one ♀, Weedley Spring, one ♂, Humber shore at Patrington, one ♂, Withernsea Carrs, three ♀s, Houghton Woods (Market Weighton), ♂, ♀, T.S.; Kelsey Hill, E.A.P.; Riccall and Skipwith Commons, ♂s and ♀s, W.P.W., T.S., W.F.

V.C. 62.—Scarborough, H.C.D., *Naturalist*, August, 1908, p. 299; Nunthorpe, one ♂ near station, Farndale and Eston Moor, J.W.H.; Hayburn Wyke, ♀, T.S.

V.C. 63.—Martin Beck Wood, Doncaster, C.

V.C. 64.—Sawley High Moor, four ♂s, two ♀s.

L. hortensis Sund.

Widely distributed in the British Isles and on the Continent, but not common in Ireland; amongst grass and low vegetation usually in woods. *Adult* May to July. First record—R. H. Meade, Bradford, 1851, *Zoologist*, Vol. X., 1852, p. 3678, sub *L. pratensis* Wid.

V.C. 61.—North Cave, Birkhill Wood, Coniston Coppice, Hall Ings (Cottingham), Hornsea, T.S.; Swine Woods and North Ferriby, E.A.P., T.S.

V.C. 62.—Nunthorpe, ♀, Farndale, Greenhow Botton, Turkey Nab,

Gt. Ayton Moor, J.W.H.; Kirby Moorside, H.C.D.; South Cliff, Scarborough, R.A.T.; Hayburn Wyke, both sexes, T.S.

V.C. 63.—Saltaire Seven Arches, J.A.B.; Martin Beck Wood, Doncaster, C.; Askern; Ainley Place (Slaithwaite).

V.C. 64.—Grass Wood, Howden Ghyll (Keighley), Bradley Gill (Skipton), Trench Wood (Saltaire), Newby Moss (Ingleborough), W.P.W.; Shipley Glen, N. Airey; Malham, Y.N.U.; Bishop Wood, T.S.; Hackfall; Risplith (Ripon); Knaresborough; Rigton and East Keswick; Dalton Lane; Stubbing Moor.

L. *clathrata* Sund.

Of Holarctic distribution, and usually common; in a variety of situations. *Adult* throughout the year. First occurrence—R. H. Meade, Bradford, S.G.B.I. In all the vice-counties, common and generally distributed.

Gen. *Stemonyphantes* Menge, 1-1.

S. *lineata* Linn.

Very common and very widely diffused over the British Isles, the whole of Europe, and the north of Africa, Asia and North America; amongst grass, heather, etc., and fallen leaves. *Adult* throughout the year. First record—R. H. Meade, S.G.B.I., Bradford, V.C.H. Generally distributed throughout the county, but seemingly most plentiful in the hillier parts of V.C. 62, 63, 64.

Gen. *Floronia* Sim, 1-1.

F. *bucculenta* Clerck (*Bolyphantes bucculentesus* Clerck).

Rare; unknown in Scotland and only recently found in Ireland; noted for Dorset, Channel Islands, Wicken Fen, Lancashire, Cheshire, Lincolnshire, Staffordshire, Cumberland and Northumberland; have had both sexes from Lincolnshire and collected females at Eastbourne and Polegate, in Sussex; abroad, the countries of North and Central Europe and the United States. *Adult* July to September. First record—R. H. Meade, Bradford, 1851, S.G.B.I., sub. *Linyphia frenata* Bl.

V.C. 61.—Skipwith Common, one ♂, 1908, Snake Hall, one ♂, 1912, T.S.; Skipwith Common, one ♀, September, 1911, W.P.W.

V.C. 62.—Saltburn, one ♀, J.W.H.

V.C. 63.—Bradford, R.H.M.

(To be continued).

——: o :——

Stories for the Nature Hour, by **Ada and Eleanor Skinner.** London: Harrap & Co., 253 pp., 5/- net. In this volume the editors have gathered together stories on the Snowdrop, Blade of Grass, How the Rose became Queen, The Wren, The Dragon Fly, and about forty others, by various writers, including a few by the editors themselves, suitable for children in 'the Nature Hour.' They have been very carefully selected, and can be recommended as most suitable for scholars.

Birds and Man, by **W. H. Hudson.** Duckworth & Co., 306 pp., 6/- net. This volume was published some little time ago, but a notice of it in this journal, though belated, enables us to draw attention to one of the most fascinating of the volumes prepared by Mr. Hudson, whose work, 'The Naturalist in La Plata,' will be well known to our readers. Among the fifteen chapters we notice the following headings, The Dartford Warbler, A Wood Wren at Wells, Something Pretty in a Glass Case, Ravens in Somerset, Early Spring in Savernake Forest, Selborne, etc.

THE NUMBERING OF 6-IN. TOPOGRAPHICAL SHEET FOR REGIONAL SURVEYS.

W. ALFRED RICHARDSON, M.Sc., B.Sc., F.G.S., A.M.I.M.E.

THE method of numbering ordnance sheets, however useful from the official standpoint, is highly inconvenient for extensive work in the field. If the 6-in. quarter sheets are divided into two for field use, it is usual to number them as follows :—

Leicestershire XXII., S.W. ; E. (or W.).

91	100	99	98	97	96	95	94	93	92	91
81	90	89	88	87	86	85	84	83	83	81
71	80	79	78	77	76	75	74	73	72	71
61	70	69	68	67	66	65	64	63	62	61
51	60	59	58	57	56	55	54	53	52	51
41	50	49	48	47	46	45	44	43	42	41
31	40	39	38	37	36	35	34	33	32	31
21	30	29	28	27	26	25	24	23	22	21
11	20	19	18	17	16	15	14	13	12	11
1	10	9	8	7	6	5	4	3	2	1
91	100									

Or, if, as some find more convenient, the quarter sheets are divided into four, they must be numbered :—

Leicestershire XXII., S.W. ; N.E. (or S.E. or N.W. etc.)

These numbers are far too clumsy to state in the front of the field sheets, where the numbering is most convenient. This is especially the case when working near a county boundary, for the name of the county must then be stated on each of the field sheets. Accordingly, since extensive regional surveys for geological, botanical, and geographical purposes are based on topographical sheets, it is thought that the simple method of numbering described below might be found useful to others.

The sheets, divided for use in the field, are arranged in blocks of 100. As an example, let it be considered that the 6-in. quarter sheets have their margins removed, and are

1920 Sept. 1

divided into four, the ordnance numbers being written on the back. This division is a convenient size for the field, since the sheets can be fixed by indiarubber bands to a post-octavo writing pad, and used without any folding. The proposed method of arrangement will be seen in Fig. 1, where the thick lines shew the boundaries of a block of 100 sheets ; the thin full lines the boundaries of the 6-in. quarter sheets ; and the dotted lines the boundaries of the field sheets. The block is numbered consecutively from 1 to 100, commencing at the S.E. corner and working west for each line. There are ten sheets horizontally and ten vertically. The numbers are written in small ink figures on the extreme N.E. corner of each field sheet.

It is easy to find adjacent sheets. For example, suppose one to be working on sheet 47, the sheet to the north is 57 ; the sheet to the south is 37 ; that to the east is 46 ; and that to the west is 48. It is convenient to draw out the numbering scheme on a half $\frac{1}{2}$-in. or $\frac{1}{4}$-in. sheet of the district, and by its means the sheets required for a day's traverse can be readily picked out.

If the whole block is not required for a survey, the sheets are nevertheless numbered on the same scheme, and the sheets not in use are left blank on the $\frac{1}{2}$-in. index.

On the other hand, if the district is so large, or so shaped, that the sheets required cannot be arranged in a single block, it is still convenient to keep to the arrangement in hundreds. The different blocks may be distinguished by the addition of a small letter to the number. I have, however, found it convenient to use different coloured water-proof inks for distinguishing the various blocks. It will be seen that the finding of neighbouring sheets on different blocks is also easily done by the similarity of the numbers. Thus the sheets adjacent to No. 10 are, to the south, No. 100 on the S. block, and, to the west, No. 1 on the W. block.

This system will be found to facilitate greatly subsequent reference to field work, and simplify the statement of map references on specimen labels.

——: o :——

Dr. D. Woolacott writes ' On an Exposure of Sands and Gravels containing Marine Shells at Easington, Co. Durham,' in *The Geological Magazine* for July, in which he compares the deposits at Easington, Co. Durham, with the Kelsey Hill beds in Holderness. He says : ' The horizontally and regularly bedded gravels at Easington seem to have been deposited on the platform on which they lie, and this level shelf would appear to have been cut by the wave action when the deposit was formed. The formation has, indeed, all the characters of a true raised beach, but it is possible that these may be deceptive. After my re-examination of the Kelsey Hill deposit I admit this possibility. I am, however, not convinced that the evidence obtained from an examination of the deposit is sufficient to prove that it is not an uplifted sea-beach.'

THE ECOLOGY OF THORNE WASTE.*

E. ADRIAN WOODRUFFE-PEACOCK, F.L.S., F.G.S., ETC.

ONE of the most interesting relics of the Middle Ages, in my early days, was Thorne Moor or Waste, as it was more frequently called. From its then only imperfectly drained surface in the seasons 1874-75 I sent out hundreds of specimens of the *Droserae* to workers in many parts of England, who had just read Darwin's *Insectivorous Plants*, then recently published. The original area of this bog was about 26 square miles, though in my time the unwarped portion was only about 16 ; but of late years the exposed peat had been greatly reduced by cutting down and burial by fresh warpings. As it is only a question of time before the whole area of turf is removed or covered by Estuarine-alluvium, I have attempted to outline what once existed, where high cultivation will wholly prevail in the future.

In geographical position this hag was situated between Crowle, in Lincolnshire, and Thorne and Goole, in Yorkshire, but was nearest to the Lincolnshire village, to which its turbaries approached within a quarter of a mile before they were warped. It was a true bog of vast but uncertain age ; as typical in history, growth and flora as any Irish or Scotch ones I have ever studied or read of. Though practically in Yorkshire, and quite so by name, it once extended, *i.e.*, before the warping came, well into Lincolnshire, especially north and south of Crowle village. There, on its western edge, or Lincolnshire and partly Yorkshire side, the largest turbaries of the whole area, and therefore most botanically interesting district, was found. These turbaries have been covered with warp for nearly eighty years now, but the exact date I could never learn, but approximately I judge about 1842. (19.) †

When I first knew Thorne Waste well in 1874, it was ' a shaking bog,' trembling in waves when you jumped on its ' scurf,' ' floral blanket,' or firm upper surface, till the undulations were lost in the distance or at the edge of the nearest ditch. Now that it has been so much more perfectly drained I have not experienced this liquidity in the upper layers of this hag in any visit since 1891. The drier central and southern portions were much higher than its lower, thinner and wetter outside edges ; and its whole area, approached from whatever point, was considerably higher than the drift soils or warp

* This paper is dedicated to my old friend and teacher, Dr. F. A. Lees, author of *The Flora of West Yorkshire*, with best wishes.

† The numbers refer to my authorities to be published at the end of this paper.

1920 Sept. 1

surrounding its circumference. The warp by its weight begins compressing the underlying peat even when it is being laid down, but more especially when the land is fully drained and under cultivation, and continues to do so for many—but for a still uncertain number of—years. So much is this the case that old warp which was once practically level, lying on once approximately level peat, formed originally on the hills and hollows of blown-sand, falls in time into ridge and furrow, reproducing in a modified form, the contour of the underlying sands. This ' fall of the peat,' or its compressibility, is shown best at Holme Fen, Whittlesea, where the iron pile driven into the underlying Chalky-Boulder-Clay, for the purpose of testing this very point—the amount, regularity, and continuance of the peat shrinking—stands out of the ground twelve feet, or the tilth is now that distance below the point where it was originally brought into cultivation. This Thorne bog in my time, however, was most elevated, where its more central or south edge flora consisted practically wholly of pure *Pteris*. For the remains of this fern, which I have known produce fronds to the height of eight feet on this waste, accumulate much more rapidly from its larger growth than that of any other dry bog land peat species. There is only one exception to this rule, which was once the case at Thorne Waste, that is, where the largest forest trees, such as *Pinus* and *Quercus*, and others, killed by toxic-atrophy or by peat water, having been blown down by south-west winds, are in the process of burial by *Sphagnum* or *Hypnum* peat. In such cases a depth of bog as great as Thorne Waste shows at any known spot, may accumulate in as short a period as fifty years. (8.)

In its more central portions, the southern edge, but not in its northern and western sides, the peat of the Waste was once from twenty to fifteen feet deep ; and where *Pteris* grows I have heard of eleven feet and more of a practically pure deposit of that species, lying on an ancient woodland area (see below), which had been swamped and destroyed by acid water and peat growth. This woodland in some places stood rooted on the Sandy-River-Gravel of this district, but in other spots had been produced on a shallow acid moor peat, in contradistinction to bog peat, which had been dried out and become fit for tree growth at some distant unknown date, as is so often the case in bogs. What is my authority for this beyond the late W. Tune, ' the dyker,' or who told me that *Gentiana Pneumonanthe* was one of the species of this low sandy acid moor flora? I cannot now say.* (1, 2, 3.)

* Can anyone now let *The Naturalist* know who made the borings into this bog? I have lost or mislaid my notes, though I know they were made after 1880.

In rainy seasons, too, as friends pointed out to me, 'its central mass was feet higher when full and swollen with water, than in dry summers with normal rain fall, as it lifted as it swelled on the principle of in summer the dry and in winter the wet sponge.' This I have over and over again observed personally from the Great Central Railway line, as in wet times nothing on its northern side was visible which could be clearly distinguished in dry summer weather. In 1875 it was estimated that the winter rise and summer fall of the bog was about six feet, in an abnormally wet season in the 'sixties, eight feet. (1, 2, 4, 13.)

Though typically a first-rate example of a *Sphagnum-Pteris* bog of great area, its flora was far more varied forty to eighty or more years ago than that of an old bog untouched by man should be. Human interference, or the breaking of its scurf or floral covering, which consists of but a few species, such as is brought about by making drains, dykes, turbaries, 'wells' for duck taking in traps or shooting, and decoys on its surface, of which there were six, had told their tale. These fractures of the scurf in every case, with the single exception of those for decoys,* reduce the natural but crushing out competition of the scurf flora by destroying it or rendering it innocuous, or at least not serious.

To such open water-localities as these named, thanks to the seed carrying gifts of all species of ducks, waders and other moorland fowl, a continual flow of various species of water plants is ever coming during the late autumn and early winter from outside areas, especially from the north and east. This was distinctly the case on Thorne Waste in the former turbaries on its eastern side, situated in Lincolnshire and Yorkshire. Under strictly normal circumstances, *i.e.*, without man's intervention, an unbroken moor covering or envelope could not have possessed, for example, the ditch, pool and turbary flora recorded below ; for these plants could never have obtained a footing on its surface when borne by fowl from the wet sandy-heath-association found in the shallow flashes of the Isle of Axholme, or of Scotton Common, close by in north-west Lincolnshire, or when carried like *Scheuchzeria* from more distant centres of distribution. The right kind of opening for a true *nidus* is just as much required as ducks or

* Waters which are over-stocked like decoys with ducks are 'too ducky,' as 'home ponds' near farm buildings, are 'too domestic ducky,' for the growth of any species of plants common or rare. Ducks carry the seeds to them, but they are eaten at once, or at least never come to anything, so never look into working decoys for rare plants, but into the ponds or pits in *their* immediate area, as this study amply proves. These are more rarely visited by fowl, but quite frequently enough to supply most of the good things carried by ducks. In this way *Scheuchzeria* was found last on Thorne Waste.

other fowl frequently passing from east to west, or locally from spot to spot.

As regards the means of carriage for plant seeds, as late as 1870 ' flocks of wild geese of three species '—' kinds ' was the word used—' numbering as many as 10,000 at a time, to escape the harrying of the Humber punt gunners, would collect on Thorne Waste and the warpings on its northern edge, to rest there securely till the evening twilight.' There they were safe from all molestation except in very severe frosts with fog, when gunners could creep up to them along and under cover of the sides of the solidified dykes and ditches. No man could traverse these water cuts, as I first knew them, in other circumstances without ' fen boards,' which a crouching man cannot use, for less than five minutes would have sunk the strongest swimmer overhead in black oozy peat about eleven feet deep. I still hear that there are some geese, and duck innumerable there, as was the case when I knew it best forty-five years ago. (1, 2, 4, 6.)

(To be continued).

——: o :——

William Smith: His Maps and Memoirs, by **T. Sheppard.** Hull : A. Brown & Sons, pp. 75-253. This is a reprint of the Memoir published a little while ago by the Yorkshire Geological Society, and has been issued with a cloth cover in the belief that some would care to have the volume in a more permanent form. The original pagination has been adhered to, and a short preface gives particulars of some discoveries made since the original paper appeared.

Wasp Studies Afield, by **Phil** and **Nellie Rau.** Oxford University Press, 372 pp., price 8/6 net. This volume of the Princeton University Press, U.S.A., contains an admirable series of stories relating to the habits of the various members of the wasp family met with in America. The articles are very cleverly written and well illustrated, resulting in a fascinating volume. The following extract from the cover defines the scope of the work. ' Do you know how the Wasps build and burrow? How they work and play? Have you ever seen their sun-dance? The authors have watched it all, and report their observations with scientific accuracy, and in most entertaining style. There are chapters on place-memory, instinct, and heredity, with reports on some ingenious experiments.'

Wild Life in Canada, by **Capt. A. Buchanan, M.C.** London : John Murray, 264 pp., 15/- net. This book is a record of an expedition to the almost unknown region of British North America, beyond the white man's frontiers of Saskatchewan. Capt. Buchanan records his study of the animal life, the fishes, and birds of the far north, not only in a purely scientific manner, but with a broad free outlook that may well interest layman and naturalist alike. He also pictures the wild beauty of many wonderful scenes of gigantic waterway and wilderness ; the life of the red man in his wide surroundings ; his modes of travel in summer and winter, and means of livelihood. We can say that Capt. Buchanan is a thorough naturalist, and his observations have been carefully made and put together in a very readable manner. There are numerous illustrations from photographs.

FALLEN BLOCKS NEAR BLEA WYKE POINT.

H. E. WROOT,
Leeds.

THE members of the Yorkshire Geological Society on their visit to Ravenscar on July 17th, examined one of the blocks described and figured by Mr. F. G. Percival, B.Sc., F.G.S., in *The Naturalist*, last September (p. 291). The stone in question is pitted with about a dozen rows of oval depressions, arranged with extreme regularity. The result of the examination was a very definite opinion on the part of those present that the depressions were due, as Mr. Percival suggested as possible, but unlikely, to two systems of ripple-marks crossing each other.

The two sets of ripple-marks were formed, however, as Professor Kendall pointed out, not in the same stratum of sand, but in successive strata, and the surfaces were hardened by a ferruginous deposit, perhaps quite thin. At the spots where the crests of the lower set of ripple-marks coincide with the troughs of the upper set the hardened layers would be almost or quite in contact and would constitute strong places. But where the troughs of the lower set of ripples has underlain the crests of the upper set the two strong films would be separated by soft weaker material. The upper film here would readily give way, and a pit squared in form would be produced. The hard film and softer core occasionally gives rise to the sharp projecting edge which Mr. Percival writes of as 'under-cutting.'

This theory of the origin of the marks, suggested by Professor Kendall, gained strong confirmation from the discovery of another marked stone—a very large one lying about twenty yards north of the other. In this case the marks had not the same regularity, but the surface stratum of sand being a little thicker the structure was more clearly to be distinguished. No evidence was detected to confirm the supposition put forward by Mr. Percival that the marks on the smaller stone were due to an impression of the skin of some reptile.

——: o :——

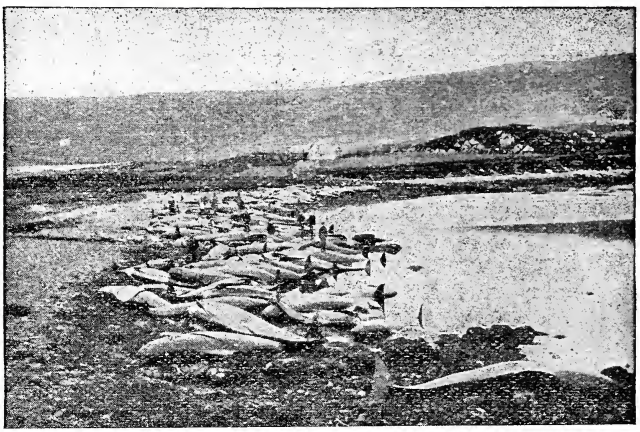
Mr. J. W. Barry's paper on 'Some Abbey Problems and Discoveries,' (20 pp.) has been issued as Whitby Museum Publication No. 2, price 6d.

The death is announced of Sir Norman Lockyer, the well-known astronomer, who was born at Rugby, in 1836. He founded *Nature* in 1869, and was actively connected with that successful journal till his death. Glasgow, Edinburgh, and Aberdeen gave him the honorary degree of LL.D.; Cambridge and Sheffield the hon. Sc.D.; Oxford the hon. D.Sc.; the British Association elected him as President for 1903-4, and Cambridge appointed him Rede Lecturer as early as 1871. In 1897 he was created K.C.B.

REVIEWS AND BOOK NOTICES.

Trout Fishing, Memories and Morals, by **H. T. Sherringham.** Hodder & Stoughton, 296 pp., 12/6 net. The writings of the Angling Editor of *The Field* are too well known to require any recommendation. In the present volume he has gathered together a fascinating series of stories bearing upon his favourite pastime. A reader does not require to be a naturalist nor an angler in order to appreciate the beauties of this book. There are illustrations of the author's favourite haunts.

The Cambridge University Press continues to publish its well known volumes in the County Geography Series, and at the present rapid rate doubtless the whole country will soon be covered. The plan of the volumes has been referred to from time to time in our pages; it only therefore remains for us to draw attention to the fact that among the recent publications are **Dumbartonshire,** by **F. Mort,** 155 pp.; **Caithness and Sutherland,** by **H. F. Campbell,** 168 pp.; **Kirkcudbrightshire and Wigtownshire,** by **W. Learmouth,** 149 pp.; **Orkney and Shetland,** by **J. G. F. Moodie Heddle** and **T. Mainland,** 167 pp.



Shoal of Whales.

These are issued at 4/6 each, and are slightly smaller in size than the volumes originally issued, though the Dumbartonshire volume also appears in the original large size.

The Glow-Worm and Other Beetles, by **J. H. Fabre.** Hodder & Stoughton, 488 pp., 8/6 net. We feel it is only necessary to draw our readers' attention to the fact that still another work by the great French Naturalist is on the market. There is an exceptionally large number of chapters, dealing with various aspects of insect life, which have been translated into English by Alexander Teixeira de Mattos, F.Z.S., who has succeeded in conveying much of the poetry of M. Fabre's observations in the translation.

Nooks and Corners of Yorkshire, by **J. S. Fletcher.** London: Eveleigh Nash, 304 pp., price 5/- net. In this little volume Mr. Fletcher rather refers to the out-of-way places in this county, than to the larger towns and cities. For example the only reference to Hull is that the people there believe that Hornsea and Withernsea are healthy places for a holiday! He speaks pleasantly of the many interesting places in the county, and gives much interesting information relating to those which have some tradition or history attached to them, and in addition

to Archæological notes there are occasional brief references to the Geology, etc., of the county. A good map, in colours, accompanies the volume.

Jack's Insects, by **Edmund Selous,** popular edition, 183 pages, 3/6. This volume is the first part of a book published in 1910. It relates the experience of a boy and girl among insects. There are imaginative conversations between the one and the other. In this way a fund of valuable information is given in a very fascinating style, and the numerous quaint illustrations by J. A. Shepherd make the book a very desirable gift to a boy or girl. We should like to congratulate our contributor on a very charming production.

The Nature Study of Plants, by **T. A. Dymes.** London : S.P.C.K. pp. viii. and 173, 6/- net. It is long since a book on plants appeared which was at once so simple, accurate and helpful to the lover of plants as this little book by Mr. Dymes. The author shows a thorough grip of fundamentals, the true instinct of the naturalist and an envious power of clear and simple expression. Part I of the book deals with the factors of life (*a*) respiration, nutrition, growth, protection and rest, which are concerned with the preservation of the individual, and (*b*) reproduction and the care of children, which are concerned with the preservation of the race. In these chapters the natural history of the plant is clearly pourtrayed in pleasing and simple language with a rigid avoidance of the nonsense so commonly introduced into popular accounts of competition and struggle in nature, and the use of such structures as hairs, glands, prickles and spines. At each stage the author shows the similarity between plants and animals in all their great functions, but adds that we know nothing whatever about mind, intellect or brains in the vegetable world, 'not even enough to be quite sure there are none'! Part II. consists of a study of the Herb Robert (*G. Robertianum*) and is an excellent illustration of the method and value of life-history studies. Mr Dymes tells us he has written the book for the 'hobby-rider,' and he certainly shows what a delightful hobby plant study is, and we can recommend it to all nature lovers, both old and young. There are 53 original illustrations, of which 21 are from photographs, and there is a brief introduction by Prof. F. E. Weiss.

Conifers and their Characteristics, by **C. Coltman-Rogers.** London : Murray, pp. x. and 333, 21/- net. The author in this work soon convinces us of his interest in, love for, and good working knowledge of the Conifers, and he has written it for those who, like himself, 'are possessed of no sky-high botanical aspirations.' He is not impressed by 'Professors from schools of forestry, and other wiseacres,' and pursues a line quite unconventional, often very pleasing, and at times amusing, *e.g.*, in dealing with the characters of the branches of Silver Firs he says (pp. 69-70), 'Out of twenty-six species of Silver Firs . . . . eight are corrugated . . . more after the manner of waves in a choppy sea than the more gradual and gentle gradients of a ridge and furrow field in a Midland county. Fifteen are smooth surfaced . . . and may be compared to the unruffled surface of a mill pond, and in one or two instances . . . likened to the little ripples we sometimes see making commotion in still waters which the winds of heaven have agitated.' However, for those who revel in more technical details he has provided 43 pages of 'Identifying Tables of the Natural Order of Coniferae.' This he has found useful as a 'Ready Recogniser' in the forest and garden. In this section, and in the body of the work, all specific names begin with a capital letter, and thus the author solves for himself a troublesome problem, not unfamiliar to our readers. There are four plates from photographs of branchlets and cones, and a few crude sketches in the text. A perusal of this work leaves us with a feeling that the habit suggested in the couplet on page 253 had extended its range :—

> 'That in matters of Commerce the fault of the Dutch
> Is in giving too little, and asking too much?'

NORTHERN NEWS.

Prof. F. O. Bower's address on 'The Earliest known Land Flora,' appears in *Nature* for July 29th and August.

James William Thompson, of Burnley, left £50,000 to Burnley 'for the purchase of lands for a park, art gallery, museum and a covered winter garden.'

Publication No. 74 of the Belfast Municipal Art Gallery and Museum deals with Irish Gold Ornaments. There are 8 pages and illustrations. The publication is sold at 1d.

The Journal of Roman Studies, Vol. VIII., Part 2, includes a paper on the 'Date of the Defeat of C. Pescennius Niger at Issus,' by M. Platnauer, and 'Professor Haverfield: a Bibliography,' by Geo. Macdonald.

By the kindness of Mr. C. Thomas-Stanford, Lewes Castle has been given to the Sussex Archæological Society as Trustees for the Nation. Lewes Castle contains an important collection of Sussex antiquities.

Under the will of the late R. E. Pannett, of Whitby, the Church Hill estate, on which an art gallery and a museum are to be erected, and the chalybeate spring in Bagdale, are bequeathed to the town of Whitby.

'Bird Tracks in the Snow,' by R. Clapham, 'Bee-eaters in Scotland,' by J. K. Nash, 'Hobby in Shropshire and Yorkshire, and Black-tailed Godwits inland in Lancashire,' appear in *British Birds* for August.

At a meeting of the Lords of the Manor of Bridlington recently, it was reported that the nucleus of a local museum had been formed, and gifts were announced. We believe the specimens will be housed in the Bayle Gate, Bridlington.

The forty-ninth *Annual Report and Proceedings of the Chester Society of Natural Science, Literature and Art* (50 pp.) has been issued, and contains reports on the work of the various sections. Among the natural history items we notice 'Observations on the Birds of Deganwy, North Wales,' by A. Hamilton; and 'Lepidoptera of the district with illustrations of new varieties,' by A. Newstead.

The death is announced of John Gerrard, F.G.S., M.B.O.U., His Majesty's Inspector of Mines for the Manchester and Ireland area, at his residence, Worsley, Lancashire, at the age of 70 years. He was educated for the mining profession, and was appointed on the list of mines inspectors in January, 1874. He was a prominent member of the Manchester Geological and Mining Society, to the membership of which he was elected in 1892, being elected President in 1904. He was also a member of the Yorkshire Naturalists' Union.

In this Journal for July, in referring to the *Geological Magazine*, we stated that 'the "contents" on the cover of the Magazine do not agree with the contents inside.' We wrote this as we had just previously copied various titles from the 'contents' in connexion with a bibliography which we issue, and on looking inside we found that the actual titles of the articles were different, and the slips had to be re-written. We therefore concluded that the 'contents' as shown on the cover did not agree with the actual titles of the papers inside, and we thought we had made this clear. We hear, however, from Mr. R. H. Rastall, who has recently joined the editorial staff of that Magazine, that the sentence 'as it stands, is a direct imputation of fraud or misrepresentation against the editor or publishers or both.' Such a suggestion never entered our minds, and we are sorry that Mr. Rastall should read in it anything of the kind. We hope he is the only one who interprets the sentence in that way. Presumably what we should have stated was that the titles of the papers as given in the list of 'contents' did not agree with the titles of the papers as they appear in the Magazine. May we take this opportunity of asking our readers who are interested, to subscribe to the *Geological Magazine*, and thus help it to 'carry on.'

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London. Sept. 1st, 1920.

OCT. 1920. No. 765
No. 539 of current Series

THE NATURALIST

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

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;
AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
G. T. PORRITT, F.L.S., F.E.S.
JOHN W. TAYLOR, M.Sc. RILEY FORTUNE, F.Z.S.

Contents :—

LONDON:
A. BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.
Printers and Publishers to the Y.N.U.

Price 9d. net. Prepaid Subscription 8/6 per annum.

YORKSHIRE NATURALISTS' UNION.

BOTANICAL SECTION.

ANNUAL MEETING, October 2nd, at 3-30 p.m., in the Botanical Department, Leeds University.

Business :—Discussion of Annual Reports ; also nomination of Officers for 1921.

After Tea, short communications will be read :—

Prof. Priestley, **" Autumn Colouration of Leaves."**

Mr. Pearsall, **" Notes on Vegetation of Yorks. Lakes."**

Other suitable papers will be welcome.

CHRIS. A. CHEETHAM,
Farnley, Leeds.

COMMITTEE OF SUGGESTIONS.

A FIELD MEETING will be held for the purpose of demonstrating methods of Peat Investigation, on October 16th. Members will meet at 2-30 p.m. at Sandshills Lane, Moorallerton, Leeds.

GEOLOGICAL SECTION.

The Geological members will probably meet at the University, at 6 p.m. the same evening, but details can be had from

Mr. J. A. HOLMES,
Crosshills, Keighley.

VERTEBRATE ZOOLOGY SECTION.

President : A. HAIGH LUMBY, Esq., Shipley.

MEETINGS will be held at the Leeds Institute on Saturday, October 23rd, at 3 and 6 p.m. (Wild Bird and Egg Protection Committee at 2-30 p.m.)

Business :—Election of Officers ; Report of Protection Committee ; North, East and West Riding faunal reports for the year ; short papers on Zoological topics. Specimens, photographs, and notes welcomed.

Will Secretaries announce to Societies ?

WALTER GREAVES, *Hon. Sec.*,
1 Chapel Avenue, Hebden Bridge.

ANNUAL MEETING OF THE ENTOMOLOGICAL SECTION.

President: G. T. PORRITT, Esq., F.L.S., F.E.S.

Two meetings will be held in the Committee Room, at the Institute, Cookridge Street, Leeds, on **Saturday, October 30th, 1920,** viz., at 3-15 p.m., to consider and pass the Sectional Reports and to elect Officers for 1921 ; and at 6 p.m., at which entomological topics will be discussed. Exhibits of all orders of insects are invited. Members and Associates of the Union are cordially invited.

The Secretaries earnestly solicit notes and records made during the season on Entomological subjects in the county, and specially ask that these should be *in their hands by October 1st* for inclusion in the Annual Report of the Union.

Secretaries:—*Lepidoptera*, B. MORLEY (Skelmanthorpe), and H. H. CORBETT, M.R.C.S. (Doncaster) ; *Hymenoptera*, ROSSE BUTTERFIELD, F.E.S. (Keighley) ; *Diptera*, C. A. CHEETHAM (Wortley, Leeds) ; *Coleoptera and Hemiptera*, W. J. FORDHAM, M.R.C.S., F.E.S. (Sheffield) ; *Neuroptera, Orthoptera and Trichoptera*, G. T. PORRITT, F.L.S. (Huddersfield).

B. MORLEY,
Sectional Secretary,
Skelmanthorpe.

Some British Association Officials and some Yorkshire Naturalists.

Prof. J. L. Myres (*General Secretary*), Prof. W. A. Herdman (*President*), The Hon. Sir Charles A. Parsons (*retiring President*), Prof. H. H. Turner (*General Secretary*), Mr. G. P. Cooley, Mr. T. Sheppard, Dr. T. W. Woodhead and Mr. W. N. Cheesman.

NOTES AND COMMENTS.

THE BRITISH ASSOCIATION.

The 88th Annual Meeting of the British Association was held at Cardiff during the week ending August 28th, in the midst of strikes, which seem to be as fashionable at Cardiff as elsewhere. The absence of trams caused a little inconvenience, and the streets were untidy, but as the visitors were favoured by fine weather, and as most of the meetings were held in the magnificent series of buildings centred in Cathay's Park, the inconvenience was minimised. Just as for some reason or other the meetings held in Scotland are unusually well attended, those in Wales are usually small, and Cardiff was no exception, the number present being 1378, less than at the Cardiff meeting in 1891. It is just possible, however, that the recently increased railway fares, as against the reduced fare formerly granted to the members, may have influenced the attendance.

THE MEETINGS.

The Conference usually commences with the address of the President, which at Cardiff was given on the Tuesday evening. Consequently some visitors, and among them prominent members, missed the sectional presidential addresses and meetings and excursions held on Tuesday morning and afternoon ! In addition to the lectures given to the various sections, there were evening discourses and public lectures, a civic reception, garden parties and visits to works ; the last day—Saturday—being devoted to long excursions to places in the district.

THE PRESIDENT'S ADDRESS.

As might have been expected, the President, Prof. W. A. Herdman, stuck to his last, and gave of his best on 'Oceanography and the Sea-Fisheries.' His story was most fascinating —full of valuable facts and suggestions. We wish it were possible to quote it in full. We should like to give his concluding words, however. 'Cardiff is a sea-port, and a great sea-port, and the Bristol Channel is a notable sea-fisheries centre of growing importance. The explorers and merchant venturers of the South-west of England are celebrated in history. What are you doing now in Cardiff to advance our knowledge of the ocean ? You have here an important university centre and a great modern national museum, and either or both of these homes of research might do well to establish an oceanographical department, which would be an added glory to your city and of practical utility to the country. This is the obvious centre in Wales for a sea-fisheries institute for both research and education. Many important local movements have arisen from British Association meetings, and

if such a notable scientific development were to result from the Cardiff meeting of 1920, all who value the advance of knowledge and the application of knowledge to industry would applaud your enlightened action.'

SEA FISHERIES.

'But in a wider sense, it is not to the people of Cardiff alone that I appeal, but to the whole population of these Islands, a maritime people who owe everything to the sea. I urge them to become better informed in regard to our national sea-fisheries and take a more enlightened interest in the basal principles that underlie a rational regulation and exploitation of these important industries. National efficiency depends to a very great extent upon the degree in which scientific results and methods are appreciated by the people and scientific investigation is promoted by the Government and other administrative authorities. The principles and discoveries of science apply to aquiculture no less than to agriculture. To increase the harvest of the sea the fisheries must be continuously investigated, and such cultivation as is possible must be applied, and all this is clearly a natural application of the biological and hydrographical work now united under the science of Oceanography.'

KNOWLEDGE OF THE DEEP.

In a conversation with a representative of our chief Yorkshire paper, Prof. Herdman stated that he was gratified by the amount of attention paid to his own particular subject of oceanography, and by the steps which are to be taken to forward a movement for sea fisheries research, and the exploration of the sea. In the discussion on this question Professor W. Garstang urged that the fullest possible information on all aspects of life and the conditions of life in the sea would be needed if we were to cope successfully with the inevitable difficulties of this gigantic and intricate task. In an allusion to the acute controversies, which twenty years ago surrounded the initiation of the International North Sea Fishery investigations, Professor Garstang expressed pleasure at the unanimity now prevailing as to the wisdom of that Government enterprise, and at the confidence with which representatives of the independent institutions were prepared to approve the claims and proposals of the present Ministry of Fisheries. Although there are still a few minor details to be adjusted in the relations of these institutions to the Ministry, their agreement is a matter for general congratulation, especially in view of changes in the direction of cultivation (as distinct from mere conservation) of the sea fisheries, which is bound to characterise the new era of the fishing industry.

AN OCEANOGRAPHIC INSTITUTE.

If, as is proposed, there should be established an oceanographic institute at Cardiff, the cost of erection and maintenance would probably not greatly exceed £50,000. More will certainly be heard of the whole project at the Edinburgh meeting next year, and it will be a matter in which Hull may be expected to take peculiar interest when its turn comes in 1922 to welcome the British Association. A kindred subject brought forward was the urgent need for the creation within the Empire of a central institution for training and research in the science of surveying hydrography and geodesy, and this also will appeal to every seaport. It was mentioned that the East Coast of England and the North Sea had not been surveyed for fifty years, and that in view of shifting sands and other circumstances both these and the distant waters around the world-wide British territories ought to be re-charted.

A YORKSHIRE INVITATION FOR 1922.

Next year the Association meets at Edinburgh, and in 1922 at Hull. At Cardiff a deputation was received from the Lord Mayor and Town Clerk of Hull, who gave a cordial invitation to the Association to visit their city. On the proposition of Mr. Sheppard, seconded by Mr. W. Whitaker, F.R.S., and supported by Sir Richard Glazebrook and Sir Richard Gregory, the General Committee unanimously accepted the invitation. The Association has only visited Hull once previously, and that was so long ago as 1853.

THE HANDBOOK.

A neat cloth-bound 'Handbook of Cardiff' of 314 pages, containing numerous maps, diagrams and other illustrations, was given to each member attending the meeting. It was edited by Mr. H. M. Hallett, and besides the usual information relating to the history and industries of the city, there are chapters on Prehistoric Remains, Place Names, Education, Libraries, Museums, Scientific Societies, Meteorology, Botany, Zoology and Geology, and a list of books bearing on the district. An extraordinary omission is a chapter on the Roman remains of the area. This, we believe, was due to the illness of a well-known authority on the subject, but surely there are others?

THE ADVANCEMENT OF SCIENCE, 1920.

In the 'good old days' of a year or two ago when prices of paper and printing were reasonable, it was possible to buy the volume of Presidential addresses at the British Association meetings, all neatly bound together in a good cloth cover, for half-a-crown. This year they are put in a paper cover, with the title—hardly a correct one—'The Advancement of Science,

1920,' and sold for 6/-. Prof. Herdman's address could be obtained separately for 1/-, and even the list of members had to be paid for. The familiar daily journal was dispensed with; instead was a single journal which answered for the week. Printed abstracts of papers were also few.

PRESIDENTS OF SECTIONS.

The Presidents of the Sections were as follows:—A.—MATHEMATICAL AND PHYSICAL SCIENCE, Prof. A. S. Eddington; B.—CHEMISTRY, C. T. Heycock; C.—GEOLOGY, F. A. Bather; D.—ZOOLOGY, Prof. J. Stanley Gardiner; E.—GEOGRAPHY, J. McFarlane; F.—ECONOMICS, J. H. Clapham; G.—ENGINEERING, Prof. C. F. Jenkin; H.—ANTHROPOLOGY.—Prof. Karl Pearson; I.—PHYSIOLOGY, J. Barcroft; K.—BOTANY, Miss E. R. Saunders; P.—EDUCATION, Sir Robert Blair; M.—AGRICULTURE, Prof. F. W. Keeble; CONFERENCE OF DELEGATES OF CORRESPONDING SOCIETIES, T. Sheppard.

MR. HEYCOCK'S ADDRESS.

Mr. C. T. Heycock's Presidential Address to the Chemical Section concluded with words of particular worth at the present time. 'Perhaps the most pressing need of the present day lies in the cultivation of a better understanding between our great masters of productive industry, the shareholders to whom they are in the first degree responsible, and our scientific workers; if, by reason of any turbidity of vision, our large manufacturing corporations fail to discern that, in their own interest, the financial support of purely scientific research should be one of their first cares, technical advance will slacken and other nations, adopting a more far-sighted policy, will forge ahead in science and technology. It should, I venture to think, be the bounden duty of everyone who has at heart the aims and objects of the British Association to preach the doctrine that in closer sympathy between all classes of productive labour, manual and intellectual, lies our only hope for the future."

FOSSILS AND LIFE.

The above was the title of Dr. F. A. Bather's address to the Geological Section. He dealt with the Differentia of Palæontology; Effect of the Time-concept on Principles of Classification, and as Ideas of Relationship; Descent not a Corollary of Succession; Recapitulation as Proof of Descent; The 'Line upon Line' Method of Palæontology; Continuity in Development; The Direction of Change; Seriation; Orthogenesis: Determinate Variation; Predetermination; The Study of Adaptive Form; The Study of Habitat; The Tempo of Evolution; The Rhythm of Life; and

THE FUTURE.

Under this heading Dr. Bather states: 'The work of a systematic palæontologist, especially of one dealing with rare

and obscure fossils, often seems remote from the thought and practice of modern science. I have tried to show that it is not really so. But still it may appear to some to have no contact with the urgent problems of the world outside. That also is an error. Whether the views I have criticised or those I have supported are the correct ones is a matter of practical importance. If we are to accept the principle of predetermination, or of blind growth-force, we must accept also a check on our efforts to improve breeds, including those of man, by any other means than crossings and elimination of unfit strains. In spite of all that we may do in this way, there remain those decadent races, whether of ostriches or human beings, which "await alike the inevitable hour." If, on the other hand, we adopt the view that the life-history of races is a response to their environment, then it follows, no doubt, that the past history of living creatures will have been determined by conditions outside their control, it follows that the idea of human progress as a biological law ceases to be tenable; but, since man has the power of altering his environment and of adapting racial characters through conscious selection, it also follows that progress will not of necessity be followed by decadence; rather that, by aiming at a high mark, by deepening our knowledge of ourselves and of our world, and by controlling our energy and guiding our efforts in the light of that knowledge, we may prolong and hasten our ascent to ages and to heights as yet beyond prophetic vision.'

ZOOLOGY.

Prof. J. Stanley Gardiner took for his subject 'Where do we Stand?' in which he referred to the practical value of Zoology. He dealt with numerous interesting problems:' The opening up of our north-western grounds and banks is due to the scientific curiosity of Wyville Thomson and his *confrères* as to the existence or non-existence of animal life in the deep sea. It was sheer desire for knowledge that attracted a host of inquirers to investigate the life history of river eels. The wonder of a fish living in our shallowest pools and travelling two or three thousand miles to breed, very likely on the bottom in 2000 fathoms, and subjected to pressures varying from 14 lb. to 2 tons per square inch, is peculiarly attractive. It shows its results in regular eel farming, the catching and transplantation of the baby eels out of the Severn into suitable waters, which cannot, by the efforts of Nature alone, be sure of their regular supply. Purely scientific observations on the life histories of flat fish—these were largely stimulated by the scientific curiosity induced by the views of Lamarck and Darwin as to the causes underlying their anatomical development—and on the feeding value and nature of Thisted Bredning and the Dogger Bank, led to the successful experiments on

transplantation of young plaice to these grounds and the phenomenal growth results obtained, particularly on the latter. Who can doubt that this "movement of herds" is one of the first results to be applied in the farming of the North Sea as soon as the conservation of our fish supply becomes a question of necessity?'

HEREDITY.

Miss E. R. Saunders, in her address to the Botanical Section, dealt with Heredity. 'By the term Inheritance we are accustomed to signify the obvious fact of the resemblance displayed by all living organisms between offspring and parents, as the direct outcome of the contributions received from the two sides of the pedigree at fertilisation: to indicate, in fact, owing to lack of knowledge of the workings of the hereditary process, merely the *visible* consequence—the final result of a chain of events. Now, however, that we have made a beginning in our analysis of the stages which culminate in the appearance of any character, a certain looseness becomes apparent in our ordinary use of the word Heredity, covering as it does the two concomitant essentials, genetic potentiality and somatic expression—a looseness which may lead us into the paradoxical statement that inheritance is wanting in a case in which nevertheless the evidence shows that the genetic constitution of the children is precisely like that of the parents. When we say that a character is inherited no ambiguity is involved, because the appearance of the character entails the inheritance of the genetic potentiality. But when a character is stated not to be inherited it is not thereby indicated whether this result is due to environment conditions, to genetic constitution, or to both causes combined. That we are now able in some measure to analyse the genetic potentialities of the individual is due to one of those far-reaching discoveries which change our whole outlook, and bring immediately in their train a rapidly increasing array of new facts, falling at once into line with our new conceptions, or by some orderly and constant discrepancy pointing a fresh direction for attack.'

MENDELISM AND PALAEONTOLOGY.

One long morning was occupied by a joint discussion by the members of the Geological, Zoological and Botanical Sections on "Mendelism and Palæontology." The Factorial Interpretation of Gradual Changes, especially when new characters appear later in the Individual Life-Cycle. Dr. Bather opened the discussion and asked, 'Can characters be regarded as independent, *i.e.*, as manifestations of independent factors in the germ? Does evolution take place solely by addition or loss of such factors? Is there not also

a gradual modification of the body, resulting in a continuous transition ? Palæontologists find such transition to be the rule in those cases where the geological record is sufficiently complete. Palæontologists support the theory of Recapitulation, and believe that, in many cases, gradual modification of the adult and senile body is, in the course of race-history, pushed back to earlier growth-stages. Can such cases be explained by independent factors in the germ? Does not that hypothesis invlove, first, an alteration of the germ through change in the body, secondly the determination of that germinal change in a direction harmonious with bodily change? '

RECAPITULATION.

Dr. R. Ruggles Gates followed. In his opinion, ' According to mutationist hypothesis, germinal characters arise as alterations of single elements of the germ plasm. This conception avoids the difficulties involved in considering the change as due to the loss or addition of a factor. It recognises on the one hand the solidarity of the germ plasm as a whole, and on the other the independent origin of variations in its several parts. Such variations are termed karyogenetic, since they apparently arise in the nuclei and are perpetuated by miotic division. Mutations of this nature are almost universal amongst wild plants and animals, and some of them are so small that for general purposes they are practically continuous. They differ from Darwinian conception of continuous variation, however, in that (i) they do not arise in any regular order, (ii) they are inherited as separate units. But Recapitulation is an almost equally widespread phenomenon in animals, and to a less extent in plants. The recapitulation in animal embryos, and in such fossil groups as the Ammonites, implies the addition of terminal stages to the development of the organism. From the standpoint of organic structure this process is clearly different from a mutation by which the nuclear unit is modified throughout the organism. Recapitulatory characters thus fall into two groups : (i.) embryonic, which appear always to imply adaptation of the organism to different conditions, and are best explained by the neo-Lamarckian principle ; (ii.) orthogenetic, which appear late in the life-cycle but are germinal in origin and non-adaptational.'

EVOLUTION.

Prof. J. E. Duerden, whose interesting observations on the ostrich are well known, pointed out that ' Recent investigations in genetics in general give support to the factorial hypothesis, namely, that the characteristics of the body are represented in the germ plasm, in all probability in association with the chromosomes. Supporting evidence is forthcoming

from sex, crossing-over and localisation. Any hereditary change in an organism must therefore be associated with factorial change in the germ plasm. Casual mutations readily admit of Mendelian interpretation, but evolution in general does not take place by changes of this kind. Evolution of species often seems to call for a similar change in the whole assemblage of individulas within an area, while palæontology and the study of numbers of related forms calls for gradual successional changes in the same direction as regards any particular structure (orthogenesis). Mendelian experiments do not yet afford any great support for either of these demands. Observed mutational changes do not call for environmental influence, and are wholly apart from any adaptive considerations; natural selection plays no part in the origin or preservation of variations, but may be eliminative. It is highly questionable whether somatic or environmental influences can modify the germinal factors in definite directions, but disruptive changes and gradual loss of factorial vigour, or perhaps senility, may be contemplated, continued over long ages. As the common germ plasm of a race may at any one time be presumed to be in somewhat the same condition, evolutionary changes on somewhat similar lines may be expected.'

CONTINUANCE OF LIFE ON EARTH.

Prof. W. M. Flinders Petrie had a contribution on this subject, which naturally caused some comment. In his opinion, if by any process of aggregation the earth has been at a red heat, all the lime and soda would be combined with the silica (now sandstone) and all the carbonic and hydrochloric acids would be in the atmosphere (now locked up in limestone and salt). The changes from that condition would consist in the acids gradually decomposing the silicates; at present there is only a minute fraction of the original carbonic acid left in the atmosphere. The decomposition of a few more inches of silicates over the globe will exhaust the carbonic acid, and life could not exist. This may take place in a few hundred thousand years, and such is the limit to vegetable and therefore to animal life, irrespective of solar cooling. The amount of carbon in the strata is probably enough to combine with all the oxygen of the air; hence land-breathing animals were impossible until after the carbon had become separated and left oxygen free. This agrees with the appearance of air breathers after the Carboniferous Age.

CRYSTAL STRUCTURE.

Prof. W. L. Bragg stated that the investigation into crystal structure, which has been made feasible by the discovery of the diffraction of X-rays by crystals, has led to a determination

of the precise positions of the atoms in a number of the simpler crystalline forms. Recent theories of atomic structure are largely based on the arrangement of the atoms in crystaline solids, since this arrangement affords an insight into the nature of the forces acting between the atoms. In such compounds as sodium chloride, it is probable that the atoms exist as ions of sodium and chlorine, and that the crystal is held together by the electrostatic attractions of these ions, thus accounting for the fact that there is no grouping of the atoms into molecules in the solid. In other compounds, such as those of two electronegative elements, the molecular arrangement persists in the solid state and the chemical combination appears to be of a different type from that of sodium chloride. A consideration of the distances between the atomic centres in crystals supports the conception of the two types of chemical combination.

CONFERENCE OF DELEGATES.

The delegate of the Yorkshire Naturalists' Union, Mr. Sheppard, had the honour of being the President of the Conference of Delegates this year, and in addition to his address on 'The Evolution of Topographical and Geological Maps' (copies of which were handed to the delegates present) the following subjects were discussed: 'Railways and their obligations to the Community,' by Mr. A. H. Garstang; 'The Status of Local Societies—the Means of Developing their Objects, of getting New Members, of Making Announcements and Publishing Papers.' This urgent matter was introduced by Mr. W. Whitaker, F.R.S., and discussed by the President, Profs. H. H. Turner and J. L. Myers (General Secretaries of the British Association), Dr. Bather, Mr. Mark Webb and many others. The question of the publication of scientific papers nowadays is of vital importance, and a meeting will be called shortly asking the delegates and presidents of the affiliated societies to meet in London in order to discuss the matter.

GEOLOGICAL MAPS.

The President stated that 'one of the secrets of successful collecting—and every scientific man is a collector in some form or other—is to secure series of certain specimens or objects for which few people, if any, are in search. In this way it is possible to contribute something tangible towards the advancement of science. On a previous occasion I had the privilege of bringing before your notice information relating to the past difficulties in connection with the exchange of currency, clearly demonstrating the necessity for the decimal system of weights and measures. (See 'Rep. Brit. Assoc. for 1917,' pp. 228-235.) That paper was made possible by collecting old boxes of money scales and weights, a few years' work resulting in the finest series of English examples in existence

being gathered together. In the same way, and for somewhat similar reasons, collecting old topographical and geological atlasses and maps was indulged in, and by methods familiar to experienced collectors, examples of old road-books, charts, and geological plans, diagrams, and maps began to accumulate to an extent which was positively alarming !'

AND THEIR EVOLUTION.

After reviewing in detail the stages leading up to the present geological maps, and describing the principal topographical maps from the earliest times, the soil maps, those of William Smith, Greenough and others, Mr. Sheppard concluded :— 'I trust in the preceding remarks the scientific value of the collection and study of maps has been demonstrated. In recent years there has been occasional evidence of their proper appreciation, but it should be more systematic and continuous. Certain districts have received careful and proper attention, others and far greater tracts of our islands do not seem to have received any. Without attempting to give a complete list of recent publications on the subject, I may mention as admirable examples of work : 'The Reigate sheet of the one-inch Ordnance Survey ; 'A Study in the Geography of the Surrey Hills,' by Ellen Smith, published by A. & C. Black, London, in 1910, which is accompanied by six large maps ; and a similar work issued by the same house in 1911, entitled 'Highlands of South-west Surrey : a Geographical Study in Sand and Clay,' by E. C. Matthews, with seven maps. In addition, there are the regional surveys such as those carried out by Mr. C. C. Fagg, of the Croydon Society, and a 'Regional Study of North-east England,' by C. B. Fawcett, in the 'Geographical Teacher' issued a few weeks ago.

SPECIAL MAPS.

Of a more specialised character, but still indicating progress in the evolution of mapping, are the Botanical Survey sheets of Yorkshire by Drs. Smith and Woodhead, and similar publications relating to different areas in Scotland. That more attention should be paid to maps is shown by the volumes which have recently appeared dealing entirely with the question of reading them. Probably at no period in the world's history have the advantages of accurate cartography been so vital as during the past few sad years, when it might safely be said that the future of the world's history largely depended upon the care expended in the preparation of the maps of North-west Europe. Two centuries ago it was stated 'Most Students in Geographie take more delight to contemplate the remotest and most barbarous Countries of the earth, than lightly to examine the Descriptions of their owne.' I am afraid that the same remarks applied to the years which have since passed, but we now seem to be

reaching the time when in our schools, in our scientific societies, and in the country generally, more attention is being paid to the geographical problems at home, and these can probably best be solved by an examination of our country's maps: this examination being facilitated if collections are made at convenient centres in various parts of the British Isles.'

EXHIBITIONS.

The large hall at the Technical College in which the Conference of Delegates was held was well covered by maps from the president's collection. These included Sanders' map of the Bristol Coalfield, in 19 large sheets, all the important maps of William Smith, Greenough, MacCulloch, Griffith, Arrowsmith, Walker, Ramsay, Hall, Ravenstein, Knipe, Phillips, Johnston, Geikie, Hull, Stanford and others. These had been kindly arranged by the Secretary of the Cardiff Naturalists' Society, Mr. Gilbert D. Shepherd, and a local committee, who were also responsible for an exhibition in an adjoining room to illustrate the work of the corresponding societies. This originated in a suggestion of the President, and proved a successful feature, doubly valuable due to the thoughtfulness of the President of the Cardiff society, Principal A. H. Trow, who kindly entertained the delegates to tea.

SOCIETIES' WORK.

In addition to the maps already mentioned, fine botanical survey maps were shown by Drs. W. G. Smith and T. W. Woodhead; Regional Survey maps by Mr. C. C. Fagg and the South-Eastern Union of Scientific Societies, the Cardiff Society and others, Archæological maps by the Rev. J. O. Bevan; Publications, Literature, Botanical Specimens, etc., by the South-Eastern Union, the Manchester Geographical Society and the Selborne Society; Nesting boxes by Mr. Mark Webb; the ever-willing Mr. C. A. Cheetham forwarded specimens illustrating the work of the Yorkshire Naturalists' Union Peat Committee; Yorkshire Syrphids, etc.; Mr. R. Butterfield (Keighley), a case showing the variation (melanism) of the Pale Brindled Beauty, Lantern slides illustrating British mosquitoes by Dr. Tierney, and Surrey Survey photographs sent by the South-Eastern Union, Bird photographs by the Cardiff Society, etc.; an interesting exhibition, though in some respects disappointing; many promised specimens did not make their appearance, and Yorkshire might have made a better show.

MUSEUMS AND SCHOOLS.

The final Report of the Committee on Museums in Relation to Education is a valuable document and should be carefully perused by all interested in the question of Museums and Schools. The Committee's inquiries show that Museums collectively have, on their own initiative, anticipated in a

striking way many of the requirements considered necessary for the needs of schools, a fact which illustrates their readiness to co-operate with the educational developments foreshadowed by the Education Act of 1918. It shows also that educational work on the side of Museums is possible without injury to their other functions. Given an adequate staff and an increased maintenance income, Museum curators, in conjunction with the teachers, will be able to work out suitable methods for the educational use of their collections. The experience so far gained goes far to show that the training and opportunities of teachers do not enable them to realise for themselves the possibilities of Museum collections as aids to education. Many British Museums have for years encouraged visits from schools and classes, either under the leadership of their teachers or the guidance of a member of the Museum staff. In some cases these visits have been systematised by arrangement with the educational authorities, and the Museum collections have been studied according to a pre-arranged plan. A great development of this system was tried with success in Salford and Manchester under special conditions arising in connection with the late war.'

LINCOLNSHIRE NATURALISTS.

The Lincolnshire Naturalists' Union, having found it necessary to change the printers, commences a new volume with its *Transactions* for 1919 (published 1920, 102 pp.) which starts well. The Rev. E. A. Woodruffe-Peacock (described as 'the father' of the present-day Lincolnshire Naturalists) writes a memoir on Sir H. C. W. Hawley, Bart. (President of the Union 1916-17) (with portrait); the Botanical Report (dealing in detail with Seed Dispersal); Lincolnshire Natural History Notes, from Stonehouse's 'Isle of Axholme'; a note on pupæ of Diptera in shells of Helix; and Blackbirds and Song-thrush hybrids. There are reports of the work in different sections by A. Smith, J. F. Musham, G. W. Mason, Rev. F. L. Blathwayt, H. Preston. There is the Presidential Address by Thomas Stow; Some Plants found near Woodhall Spa, 1917 to 1919, by Rev. F. S. Alston; A Holiday in Lincolnshire [plants, insects, spiders]; Marine Shells of the Lincolnshire Coast, by A. Smith, and Check List of Non-Marine Mollusca, based on the late W. D. Roebuck's notes, by J. F. Musham. In both these lists the type used seems unnecessarily large. In his list of references, Mr. Musham does not mention his own carefully compiled list, which was privately printed in 1914. There are also shorter notes. The list of members is far too short for a county with the acreage and attractions of Lincolnshire, and we trust that any of our readers who are not already members will send their names to Mr. A. Smith, at the Lincoln Museum.

SCOTTISH ORNITHOLOGY.

The Scottish Naturalist for July-August is entirely occupied by an elaborate 'Report on Scottish Ornithology, 1919, including Migration,' by L. J. Rintoul and E. V. Baxter. This deals with Birds new to the Faunal Areas and uncommon visitors, hybrids, extension of breeding range, increase and decrease in Scottish breeding species, summer and nesting, winter, ringing, plumage, habits, migration, notes on the movements of birds in 1919, and index. The Report contains many valuable and interesting records. It seems a pity, however, that our friends cannot refer to the Hawfinch without adding '*Coccothraustes coccothraustes coccothraustes*,' nor the Northern Bullfinch without adding '*Pyrrhula pyrrhula pyrrhula*,' and so on. These repetitions may be of value to the printer and paper-maker, but they do not seem to add to the scientific value of the Report.

——: o :——

Diptera flying in swarms.—Whilst with Mr. Fordham, at Austwick, Mon., on August 27th, about 7 p.m., we noticed that males of *Ochlerotatus* (*Culex*) *nemorosus* Mg., were very abundant flying in swarms after the manner of Chironomids over the pools, and quite filling the place generally occupied by the latter. Later on we saw swarms of *Rhyphus punctatus* F. around trees, flying with the hind legs hanging down like Empids. Dr. Lang's book on British Mosquitoes (*The Naturalist*, 1920, p. 179) has made the study of Culicidæ much easier, and I can record two additions to the county list, *Culicella morsitans* Theo., from Austwick, and *Ochlerotatus detritus* Hal. from Spurn. A trip up Inglebro' gave us *Ectomus alpinus* Hal., and *Clinocera rhynchops* Now. was in plenty on wet moss in the stream at Austwick Beckhead, both are additions to the county list.—CHRIS. A. CHEETHAM.

——: o :——

The National Trust for Places of Historic Interest and Natural Beauty, (25 Victoria Street, Westminster, S.W.1) has issued its report for 1919-20, which contains a record of the excellent work accomplished by the Trust, with photographic illustrations of some of the beauty spots which have been preserved, and a map of England and Wales showing the places held by the Trust. These seem to be principally around the Lake District and the Southern counties.

The Caradoc and Severn Valley Field Club has issued its transactions for 1919, Vol. VI., No. 7, pp. 215-228, which contain a record of the meetings and excursions during the year, and also the valuable 'Record of Bare Facts' (No. 29, 45 pages) which contains a classified list of records under the heads of Botany, Archaeology, Zoology, Meteorology, etc. Among the authors of these notes we notice J. Cosmo Melvill, Thomas Auden, H. E. Forrest, W. S. Ingrams and W. M. D. La Touche.

BRITISH ASSOCIATION NEWS.

Grants of over £1,000 were made for scientific research.

Mr. Sheppard was elected on the Committee of Recommendations.

A special fleet of motor cars was arranged for the members, in lieu of the trams.

The Lord Mayor's reception at the City Hall might be described as a crowded success.

Sir T. E. Thorpe, C.B., was elected President of the Association for the Edinburgh meeting.

Printed abstracts of papers and other similar literature proved to be exceedingly scarce at Cardiff.

Degrees were conferred upon some of the more important men of science by the University of Wales.

The National Museum of Wales had a temporary exhibition in the City Hall, at which were many interesting 'by-gones,' etc.

Mr. W. N. Cheesman, an ex-president of the Yorkshire Naturalists' Union, has been added to the General Committee of the Association.

The Interim Report of the Committee on Training in Citizenship (40 pp.) is a remarkable piece of work and should be widely circulated.

An informal reception was held in the Public Library on the Monday evening at which was an interesting exhibition of early scientific literature.

The Committee on the Distribution of Bronze Age Implements reported that 1649 drawings of implements had been copied and another 1000 remained to be copied.

The photograph reproduced in this issue is taken from a magnificent large group of the General Committee taken by Panora, Ltd., London, by means of the new clock-work revolving camera.

Mr. Moir had his inevitable paper on Ipswich 'artefacts.' The typed summary prepared for distribution to the press was the familiar story, except that a new name seems to have crept in, viz., Achenlean.

Drastic changes are to take place in connection with the printing of the report, etc., which will effect a considerable saving. There is also a probability of the Annual Report appearing much more promptly.

The first report of the Committee on Experiments in Inheritance of Colours in Lepidoptera dealt with *S. mendica, B. consortaria, H. abruptaria, C. dominula, Z. filipendulæ, A. grossulariata,* and their varieties.

The following notice appeared in the Reception Room. 'Complaints. It is particularly requested that no complaints be made. Any that seem needful should be handed in writing, to the City Engineer, Refuse Destructor Department.'

Dr. W. E. Hoyle, of the Welsh National Museum, proved to be an admirable local Secretary. Nothing worried him and everything went smoothly, notwithstanding the work caused by finding rooms for the members, the tram strike, etc.

The Council has under consideration the desirability of publishing an annual Bibliography of the papers on the Zoology, Botany and Prehistoric Archæology of the British Isles, the preparation of which has been entrusted to Mr. Sheppard.

The President of the Conference of Delegates had occasion to speak rather pointedly to some of the Delegates who seemed to prefer tea-parties, etc., to attending to the Conference. Unless a delegate is prepared to attend the meetings he should resign and allow someone else to attend who has his society's work more at heart.

Mr. G. H. Garfitt read a paper on a recent discovery of Rock Sculptures near a stone circle on Eyam Moor, in Derbyshire. Stones with cup marks were noticed, one of which had a considerable number, in a pattern. The characteristic 'rigole' was present. Another stone had two sculptures which represented articles made of deer horn. One of these was a deer horn pick. The other was the whole of one of the antlers and represented a plough.

In Memoriam.

CHARLES HERMAN BROADHEAD.

On July 27th there passed away, in his 60th year, Charles Herman Broadhead, head of the firm of S. Broadhead & Son, of Wooldale Nurseries, Thongsbridge. The deceased had greatly extended the Wooldale Nurseries, and in recent years was widely known for his extensive collection of Alpine plants. Many interesting rock-gardens in various parts of the country were made and stocked by his firm.

He had a genuine love of flowers for their own sake. He was keenly interested in works on gardening, and had collected at Wooldale an extensive library which included many interesting and rare works. He belonged to an old Quaker family, and was a constant attendant at meetings of that body.

For many years he had been a member of the Mycological Committee of the Yorkshire Naturalists' Union, and fairly regularly attended the Fungus Forays. He seldom remained for the full period of the Foray, but usually early resumed his business journey into which the Foray interval had been dovetailed. Gentle, kind, loving and lovable in disposition, Friend Broadhead's presence was welcomed and appreciated by old or young. Children quickly made friends with him, and he was visibly happy in the enjoyment of their society.

He was a fellow of the Royal Horticultural Society, an Elder of the Wooldale Society of Friends, and an active member of the Wooldale Adult School. He was also an early member of the Yorkshire Dialect Society. The interment took place at the Wooldale Friends' Burial Ground.

There is a short article of appreciation of the deceased in 'The Friend,' dated August 6th, 1920, the concluding words of which we can sincerely endorse:—'We deplore his passing, but we are thankful for the privilege of having known him.'

A. E. Peck, Scarborough.

——: o :——

Mr. E. E. Lowe, of the Leicester Museum, will be the president of the Museums Association for 1921-22.

'Hexanitrodiphenylamine as a Booster in Explosive Charges' is the title of a note in *The Quarry* for August.

YORKSHIRE NATURALISTS' UNION DIPTERISTS AT FARNLEY.

CHRIS. A. CHEETHAM.

AUGUST 21st was a great day for Yorkshire dipterists; eighteen members, under the leadership of Mr. Percy H. Grimshaw, assembled for the first sectional meeting; the weather was fine though not sunny, and a good district available in Park Spring, Farnley.

Perhaps the most interesting capture was *Ascia geniculata* Mg., the only species of Ascia in the British list unrecorded for the county. *Psila rosae* F. is also an addition and *Rhypholophus haemorrhoidalis* Ltt., possibly this latter is well distributed and only needing identification. Mr. J. H. Ashworth has seen it in the Ilkley district, and the writer at Clapham. A number of additions to V.C. 63 include :—

Drymia hamata Fln.
Anthomyia aestiva Mg. (*Sulcinevtris* Ztt.).
Chortophila dissecta Mg. (*Phorbia ignota* Rnd.).
Hylemyia variata F.
Siphona geniculata Deg.
Hydrellia griseola Fln.
Agromyza flaveola Fln.
Olivieria lateralis F.

Mr. W. Falconer handed in a list of diptera galls seen during the day, two seen previously unrecorded for the V.C. 63, *Carphotricha pupillata* F. (*Trypeta reticulata* Schk.), and *Phorbia seneciella* Mde.

After tea a meeting was held and a vote of thanks carried to the landowner, Mr. Wadsworth. The President of the Section, Mr. H. H. Corbett, thanked Mr. Grimshaw for the type collection of diptera he has presented to the Union, and for his kindness in leading the excursion. The collection was inspected, and Mr. Grimshaw afterwards gave a short talk on methods of collecting, mounting and identifying diptera.

——: o :——

Wild Creatures of Garden and Hedgerow, by **Frances Pitt.** London: Constable & Co., Ltd., 285 pp., price 12s. net. Miss Pitt is well known as a careful observer and expert naturalist phtoographer; and in this volume she has chronicled in a delightful manner her experience with some of the commoner wild creatures; not only in a wild state, but in captivity also. She has kept most of the mammals in captivity and has many interesting experiences to relate in connection with them. The volume in its 285 pages deals with some of the smaller mammals, including two species of bats, two birds, three reptiles and two amphibians. A valuable note is appended at the end of each chapter, giving the latest information with regard to each species and sub-species. From the preface we learn that the book has been 'written in the hope of interesting boys and girls, and some of the older people too, if possible, in the wild life of garden, hedgerow and field.' Both classes may derive much knowledge and pleasant entertainment from the perusal of the book, which is well illustrated by a number of the author's charming photographs.—R.F.

SEX HABITS OF THE GREAT CRESTED GREBE.

EDMUND SELOUS.

(*Continued from page 198*).

I am here led to consider a difficulty which I have long felt, and to which I have only recently seen, as I think, an answer. Darwinian sexual selection implies choice by one or other of the sexes as between individuals of the opposite sex. But this cannot apply to birds which mate conjugally for life (which I suspect, myself, are in the majority) so long as the tie is not, by some means, dissolved. Can, however, the essential principle of sexual selection be active, notwithstanding, and is the plurality of courting individuals no more than an unessential outcome of, or mere accidental grafting, even, upon this? As it seems to me, both these questions are to be answered affirmatively. For if we suppose a relation between the state of the individual bird, at the time of coition, and the offspring of such coition, then as the excitatory or display actions would be the index of such state, it must follow that the selection of any such actions, along certain lines, would lead to the modification of the species, through inheritance, in much the same way as selection between individuals does; for what, in that case, is the selection of one out of several nuptially displaying individuals other than that of one such display out of several? It seems possible that the male bird of any mated pair, when at a certain apex of sexual ecstasy, would stamp an image of itself superior to one so stamped during a less exalted state, and that when this applied to both the male and female, the result would be still more marked. If, then, a superior individual display in the one sex, at one time, by exciitng the other in the requisite degree, was accepted, thus leading to coition, whilst inferior ones were rejected, as the result of which rejection, coition did not take place, display action would, as a consequence, become more pronounced, and since the real working factor in such selection would be the appearance of the displaying bird, such variations of colour and plumage as occurred* would be selected, insofar, at least, as they did not militate against the general attractiveness of the display, so as to cause its rejection. In the event of their doing so, however, the union would be practically dissolved, and probably a new partner chosen. Thus, adornment and display action, in which last, figures, contours (*e.g.* the fanned tail and spread wing), as well as the charm of motion, are to be

* Variations may occur at any period in the life of the individual.

included, would advance *pari passu*, and the species become gradually more beautiful, as in Darwinian sexual selection proper, though, of course, more slowly.

This view seems to me to accord with the following statement of Howard* concerning the Wood Warbler :—' The period of sexual activity,' he says, ' is productive of much emotional behaviour . . . . . The climax of this behaviour is reached, as we should expect, during or just prior to the actual discharge of the sexual function, but I do not mean that the final stage is often reached; there is often excitement on the part of one, or of, perhaps, both sexes, which clearly does not materialise, why we do not exactly know. If the completion of the sexual act were dependent upon the periodic recurrence of a certain organic condition in both sexes, it is probable that seldom only would it reach its consummation ; if, on the other hand, the necessary condition was always present in both sexes, no check would be imposed upon a too liberal yielding to the sexual impulse. In order to overcome this difficulty, the sexual instinct is, I believe,—though it is a mere supposition on my part—allowed free play in the male, but is subject to some periodicity in the female. Thus she may be said, broadly speaking, to exercise a control, though such control is really biologically determined.'

From my own observations I am inclined to think that the above-postulated difference between the male and female bird, in their sexual relations, is an imaginary one, and that control, in the sense of non-compliance, is as often exercised by the former as by the latter—indeed, in certain species, I have thought more so.† If, however, the female would not pair unless sufficiently excited—*i.e.* pleased—at any one time, by the sexual display of the male, or *vice versa*, or if, in some cases, the mutual displays of the two paired birds did not sufficiently excite—*i.e.* please—one another, or, either in one case or in both, more represented the desire than the present power of performance,‡ there would, in one and all of these instances, be no pairing, and this explanation of the fact seems to me to be more in accordance with the whole of the evidence.

This, then, would be sexual selection, not as between different individuals, but as between different states of one and the same individual, or, more properly speaking, different

---

* ' The British Warblers,' Vol. II., part 8, p. 12.

† As in the Shag, (see *Wild Life*, May and June, 1915), the Ruff. (Zool.) Gulls, the three Grebes I have watched, etc.

‡ Satiety, nervousness, *pseudo*-readiness, hot and cold fits, etc., are all to be noted (I have noted them all) in the nuptial relations of birds. It is strange that these factors should be always ignored.

appearances standing in relation to such different states, which would thus be incidentally selected owing to the excitation aroused by such display of appearance. And, inasmuch as, so far as I can see, most birds either mate for life, or, at any rate, are content to have one permanent mate throughout each breeding-season, sexual selection was originally monogamous in its working. Polygamy, however much decried, and whether it really stands lower or higher, at any rate represents the later evolutionary development. It set the steeple on the tower, or played spire to the steeple, of conjugal union, insisted upon being ' the bright, consummate flower ' on the top of the stalk, instead of the stalk for this to rise from—a nasty trick for it to play, but we must take evolution as we find it, nor fear to draw the logical inference.

But how has this development come about? How, on this view, did such a crude, matrimonial state of things as we find in these Grebes, or, in a still ruder form between the mated pairs of other species, pass into the most finished examples of Darwinian sexual selection, where the males and females meet, in comely manner, at a certain spot, the one to court, by an elaborate display of the plumage, wherein, point by point, it is set off to the best possible advantage, the other to be courted, and, in the nicest and most critical fashion, to select this or that admirer out of many, as, in the case of the Ruff,* and, in a still higher degree, in that of the Blackcock,† I have myself, from day to day, and in the clearest manner, seen? How has this expansion of emotional capacity and refined elevation of its working been rendered possible? Whilst watching Willow Warblers, whose monogamous love-actions do not appear to have advanced beyond the first, uncouth stage of violent sexual excitement, it occurred to me that the contiguity of nesting territories (or, as I would say, but for convenience, and always mean, of localised sexual influences) was, of itself, the main cause of the frequent attacks and pursuits between one bird and another, since such contiguity must often, even if by accident, lead to the gesturing of the male of one pair, before, or in the presence of, the female of another, and to two males addressing themselves thus to the same female, so that, first by experience, and then through mental association, the mere inter-penetration of such geographical sex-vortices, would stir up those deep-rooted feelings of jealous hostility idly supposed to be the outcome of mere territorial proprietorship, which, probably, *per se*, does not exist amongst birds. Then, further, all at once, it struck me that this may have been the origin both of the assemblage and

* *Zool.*, August and Nov., 1906, and Feb., May and October, 1907.
† *Zool.*, Nov., 1909, and Jan., Feb., May and July, 1910.

the assembly-ground, in bird-courtship. For all things yield to necessity, and if the numbers of any species were to increase considerably, or even inordinately (of which we have various examples) this would crowd the breeding-areas of such species, which would lead to a greater number of battles and emotional displays amongst the males, whilst the females, for their part, would become accustomed to being solicited by several males, either at the same time or in more or less quick succession. This would inevitably tend to make them nice and discriminating, for what one becomes accustomed to, that one expects, and soon requires, so that more than one wooer having become the rule, such plurality of attention would be waited for, or even sought, locally (for old habits would still tend to limit and define the area), unless the particular display of any male were to have an irresistible effect. But this would not stop other displays of other males, or modify the changed factors of the situation, and, all the while, the critical and inhibitory powers of the hen bird would be growing, until what was usual had come to be invariable, and the habit fixed, using these words as in ordinary parlance and not with scientific precision.

(*To be continued.*)

——: o :——

Mistle Thrushes and Black-caps.—A party of mistle thrushes visit a mountain ash, close to my residence, to feed on the berries, and they are accompanied by black-caps, which also feed on the berries. I have not known before of an association of mistle thrushes and black-caps. In order to get at the fruit the mistle thrushes hang upside down like titmice.—C. F. INNOCENT, Sheffield, 30th August, 1920.

Recovery of Marked Bird!—A Starling fell down a chimney of my house on March 16th, 1919, on which I put a 'Country Life' ring (which I happened to have by me) before releasing it. The same bird, with the ring intact, came down another chimney of the house on June 6th, 1920. There are always two Starlings' nests in the roof (from which single broods are yearly reared) and doubtless the bird was connected with one of these nests.—H. B. BOOTH, Ben Rhydding.

New Scarborough Hemiptera.—By searching the undersides of leaves in Raincliffe Woods in August and September, I have this year taken the larvae of the Aleyrodid 'fly,' *Aleyrodes lonicerae* Walk., on honeysuckle, and of *Aleurochiton avellanae* Sign., on hazel. The species are apparently fairly widely distributed in the district, as the larvae of the former have occurred also in Hayburn Wyke, and of both species in Staintondale, the honeysuckle species being common there.—GEO. B. WALSH, Scarborough.

A GUIDE TO THE GENERA OF BRITISH AGARICACEAE.

HAROLD WAGER, D.Sc., F.R.S.

(*Continued from page 294*).

TABLE II.—*contd.*

75. Fungus fleshy 76
75. Fungus tough, coriaceous, corky or woody 83
76. Stem excentric or lateral 77
76. Stem absent 81
77. Stem excentric : gills adnate ... ... **Pleurotus**
77. Stem excentric or lateral : gills decurrent, sinuate or adnate 78
78. Stem excentric, annulate : gills decurrent **Pleurotus**
78. Stem excentric or lateral : gills decurrent, sinuate or adnate 79
79. Spores white 80
79. Spores pink ... ... **Clitopilus**
79. Spores ochraceous : pileus white, yellowish or reddish, flesh soft, translucent and watery : gills whitish, reddish, pale lilac, purplish or rose-cinnamon : gills not easily separating from pileus ... **Crepidotus**
80. Gills sinuate, adnate or decurrent, sometimes anastomosing near stem, edges acute ... **Pleurotus**
80. Gills decurrent, somewhat branched, fold-like, narrow, edges obtuse : pileus membranous to fleshy, convex, depressed or infundibuliform **Cantharellus**
81. Spores white 82
81. Spores pink ... ... **Claudopus**
81. Spores ochraceous ... ... **Crepidotus**
82. Edges of gills acute ... ... **Pleurotus**
82. Edges of gills obtuse ... ... **Cantharellus**
83. Stem excentric or lateral : gills decurrent 84
83. Stem absent 86
84. Gills broadly fold-like, dichotomous, edge entire, obtuse. A doubtful genus ... ... **Xerotus**
84. Edges of gills acute 85
85. Pileus pliant, fleshy-coriaceous, tough or hard : stem hard : gills white or pale yellow rose or brown, edge acute, often serrate, denticulate, crenate or irregular ... ... **Lentinus**
85. Pileus fibrous, fleshy-coriaceous : gills not serrate, edge even, acute, whitish pink or yellowish. Should be included in *Lentinus* ... ... **Panus**
86. Pileus pliant or hard, fleshy-coriaceous : edges of gills acute 85
86. Pileus dry, corky or coriaceous : edges of gills obtuse to acute, or split 87

87. Pileus membranous, thin, arid: gills fold-like, edges obtuse or split 88

87. Pileus corky or coriaceous, floccose, dimidiate, sessile: gills simple and unequal, sometimes anastomosing and forming pores behind, edge obtuse to acute (*Polyporeae*) **Lenzites**

88. Gills thick, channelled, with edges revolute: whole plant dry ... ... **Schizophyllum**

88. Gills fold-like, edge obtuse, white or ash-grey, crisped: plant soft but dry. A doubtful genus **Trogia**

TABLE III.

The Agaricaceae are usually grouped primarily into sections by the colour of their spores—*Leucosporeae* (white), *Rhodosporeae* (rose-coloured, salmon or pink), *Ochrosporeae* (ochraceous, brown or reddish-brown), *Porphyrosporeae* (purple, purple-brown or purple-black), *Melanosporeae* (black). Although this artificial classification is convenient for purposes of identification, it is possible to obtain a more natural classification based upon morphological structure. In place of sub-divisions dependent upon spore colouration, a number of natural sub-orders, with more or less well-defined morphological characters, can be distinguished as shown in the following list, which is based upon the classification given by Engler and Gilg in their '*Syllabus der Pflanzenfamilien.*'

Order—AGARICACEAE.

Sub-Order I.—Cantharelleae.

Pileus fleshy or membranous. Stem central, ex-centric or absent, not cartilaginous. Gills decurrent, thick fold-like, dichotomously branched, edge usually obtuse.

Cantharellus Juss. (Gr. *kantharos*, a cup). Stem solid or hollow. Spores white.

Trogia Fr. (Trog, Swedish botanist). Stem central: edge of gills crisped. Spores white.

Xerotus Fr. (Gr. *xeros*, dry; *ous*, an ear). Stem central: pileus leathery-membranous. Spores white.

Sub-Order II.—Paxilleae.

Pileus fleshy, margin persistently involute. Stem usually central, solid or stuffed. Gills decurrent, thick, often anastomosing behind forming pores as in Boletus, readily separating from the pileus.

Paxillus Fr. (*paxillus*, a small stake or peg). Spores whitish or yellowish.

Some species of *Paxillus* are allied to *Tricholoma*, *Clitocybe* or *Flammula*, but the genus is probably more nearly allied to *Boletus* than to any other form.

Sub-Order III.—Coprineae.

Pileus ovate or conical at first, margin straight and adpressed to stem, often striate or plicate. Stem usually simple, sometimes annulate or volvate (ring derived from volva), hollow. Gills free or adnexed. Whole fungus at maturity dissolving into mucus.

Coprinus Fr. (Gr. *kopros*, dung). At maturity whole plant dissolves into mucus by auto-digestion. Spores black, or nearly so.

Bolbitius Fr. (Gr. *bolbiton*, cow-dung). Whole plant delicate and fragile, deliquescing, but not by auto-digestion. Spores brownish-pink, or rusty.

Sub-Order IV.—Hygrophoreae.

Pileus fleshy, glutinous, viscid and watery, involute. Stem simple, sometimes with fugitive floccose or cortinate annulus. Gills thick, more or less decurrent, distant, somewhat branched.

Hygrophorus Fr. (Gr. *hugros*, moist ; *phero*, to bear). Spores white Edge of gills acute

Nyctalis Fr. (Gr. *nux*, night). Gills fleshy, thick, edge obtuse. Spores white.

Gomphidius Fr. (Gr. *gomphos*, a bolt or nail). Edge of gills acute. Spores black.

Sub-Order V.—Lactarieae.

Pileus fleshy, rigid, incurved. Stem simple, fleshy. Gills adnato-decurrent or adnate, often branched, rigid and fragile. All parts of the fungus contain branching tubes with milky, colcured or watery fluid. Spores sub-globose, spiny or warted.

Lactarius Fr. (*lac*, milk). Every part of the fungus contains a milky fluid, white or coloured. Spores white.

Russula Fr. (*russulus*, reddish : pileus often reddish in colour). Gills very brittle. Spores white.

Sub-Order VI.—Schizophylleae.

Pileus thin, membranous, dry. Stem latreal or none. Gills split longitudinally along the edge : the edges of the split portions are revolute.

Schizophyllum Fr. (Gr. *schizo*, to split ; *phullon*, a leaf). Spores white. Cf. *Trogia*.

Sub-Order VII.—Marasmieae.

Pileus thin, pliant, or fleshy-leathery, drying up without becoming putrid. Stem central, lateral or absent, cartilaginous, solid or hollow. Gills simple or denticulate, pliant, edge acute, free, adnexed or decurrent.

Marasmius Fr. (Gr. *maraino*, to wither or shrivel). Edge of gills entire, acute. Fungus thin and pliant. Spores white.

Lentinus Fr. (*lentus*, tough or pliant). Fungus fleshy-leathery, pliant, hard. Gills unequal, edge acute, often serrate or irregular. Spores white.

Panus Fr. (Latin name given by Pliny to tree fungi). Gills entire, edge acute, not serrate. Should be included in Lentinus. Spores white.

Sub-Order VIII.—Agariceae.

This sub-order includes forty-three genera which may be conveniently classified into eleven more or less natural groups or sections as follows.

Section I.

Pileus convex, more or less fleshy. Veil distinct from cuticle. Volva

and ring, or volva only present. Gills usually free, rarely adnexed or adnate.

Amanita Fr. (Gr. *amanos*, a mountain in Sicily producing many of these fungi). Volva and ring present. Spores white.
Amanitopsis Roze (named after *Amanita*). Volva only present. Spores white.
Volvaria Fr. (*volva*, a wrapper). Volva only present. Spores salmon or rose-colour.
Acetabularia Mass. (*acetabulum*, a cup or vessel to hold vinegar). Volva only present. Spores brownish.
Chitonia Fr. (Gr. *chiton*, a tunic). Volva only present. Spores brownish-purple.

Section II.

Pileus smooth, siky, scaly, granular or viscid : veil united with cuticle. Stem central, annulate. Gills usually free, sometimes adnexed to adnato-decurrent. Ring only present, no volva.

Lepiota Fr. (Gr. *lepis*, a scale). Spores white.
(**Schulzeria** Bresad. Cf. sect. IV. Gills free, but no ring, like a *Lepiota* without a ring. Spores white.)
Annularia Gill. (*annulus*, a ring). Spores pink.
Psalliota Fr. (Gr. *psalion*, a ring). Spores reddish-purple or brown. Cf. *Pilosace*, sect. IV.
Anellaria Karst. (*anellus*, a little ring). Spores black.

Section III.

Pileus fleshy, viscid or dry, naked or scaly, incurved. Stem solid, fleshy, with membranous ring. Gills usually adnate, sometimes with decurrent tooth or decurrent.

Armillaria Fr. (*armilla*, a ring). Spores white.
Pholiota Fr. (Gr. *pholis*, a scale). Spores yellow-brown or light red. (Togaria W. G. Sm. is included in this genus.)
Stropharia Fr. (Gr. *strophos*, a belt or girdle). Spores purple-brown or purple.

(*To be continued*).

——: o :——

Ray Society Monographs. Without obtaining a handle to their name as a result of membership, the members of the Ray Society quietly and conscientiously carry on the preparation and publication of the sound scientific Monographs which have resulted in anything issued by that Society being at once looked upon as authoritative. Our old friend, the late John Hopkinson, for many years acted in the capacity of Secretary, and worked very hard in his endeavours to keep the Society's publications to a proper standard. His mantle has now fallen upon Dr. Calman, who, with Prof. W. C. McIntosh (President) and Dr. S. F. Harmer (Treasurer), and a strong committee are producing valuable work. Two volumes have recently been published. The first is a Monograph of the British Orthoptera, by W. J. Lucas, which contains 264 pages and 25 plates, upon which is an enormous number of species faithfully portrayed, some in colours, and this work should make the study of this difficult class a much easier undertaking in the future. The other is entitled British Charophyta, by J. Groves and G. R. Bullock-Webster, Vol. I. : Nitelleæ. This is accompanied by 20 plates which should make the identification of these plants a comparatively easy matter, and we are glad to see that the volume is to be followed by another dealing with Chareæ. Particulars of the prices, etc., will be found in our advertisement columns.

THE AUTUMN COLOURS OF LEAVES.

PROF. J. H. PRIESTLEY,
University of Leeds.

THE Autumn of 1919 in Yorkshire appeared to the writer to be characterised by an unusually fine and long continued display of Autumn colours in the foliage. As a consequence, perhaps, more attention was paid to these colours than usual, and some observations made which other naturalists may be able to supplement and extend. A brief account of these observations is therefore given with some reference (not to be regarded as exhaustive) to previous observations and investigations, in the hope that this Autumn, and in later years, more attention may be paid to the matter by local naturalists. The writer will be very glad to receive observations and specimens bearing on the subject if sent to him at the University of Leeds.

This account may well start with the phenomenon that first drew particular attention to this subject. On October 19th, the sycamore trees around Leeds were found to show two colour patterns that were strikingly contrasted, usually all the leaves on one tree would exhibit the same type of colour pattern, but there were occasional exceptions. In both types the general area showing colour differences were the same, and as indicated roughly in the text-figure.

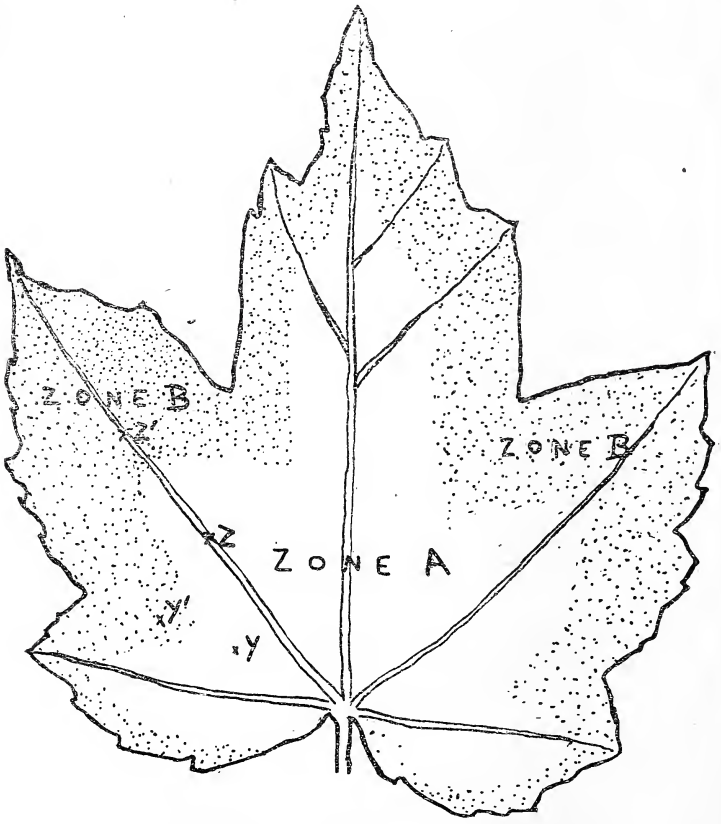
In one type the Region B was brown, yellow-brown or reddish-brown, while A was green.

In the other type the region B was green, while A was yellow or yellow-brown.

Examination of other leaves in which the Autumn colours were appearing showed that, with frequent exceptions, these two general types could usually be recognised, though in most species one of the two types was predominantly present, and sometimes, so far as observations went, this type was exclusively shown.

The possible explanation of these two types of colouring may be briefly considered. In the first place it should be pointed out that both types show a distribution suggesting a connection with the venation of the leaf. The veins of a living leaf are actively engaged upon a twofold task, on the one hand they distribute to the leaf water derived originally from the soil, and on the other they collect from the leaf the various products it has manufactured. This traffic, of the utmost importance to the vital activities of the leaf, is carried on by a wonderfully efficient network of veins, so constructed in reference to the general shape of the leaf that on the whole the distribution is brought about with a minimum

amount of movement of water and of substances carried in solution. The main areas of the leaf, the several lobes of the sycamore leaf for instance, are usually supplied by main veins distinct from the insertion of the leaf base, and from each of these, systems of branches with subsidiary branches sufficiently often repeated, convey the supplies to and from the whole



area supplied by this vein. If now the general result of this system of supply and collection is considered, in reference for instance, to the points marked Y, Y^1, Z and Z^1 upon the sycamore leaf in the text-figure, it will be seen that the conditions are essentially different for the two areas along the line Y Y^1 and Z Z^1 respectively. Z and Z^1 are situated in the close neighbourhood of a main vein along which the chief supply of water will be coming, and the materials collected

from the surrounding areas of the leaf must also pass by this route. On the other hand, Y, Y^1 are situated practically along the dividing line between the distributing and collecting areas of two main veins; they will be the last points reached by supplies from these veins, and they are not on the route by which supplies from the rest of the leaf must perforce pass.

In the light of these considerations, it is perhaps possible to understand the general shapes of the colour areas differentiated in the sycamore and other leaves in Autumn, in their relation to the venation of the leaves. The more detailed elucidation of this relation can be considered in connection with the suggestions advanced to explain the two main types of Autumn colouration already described.

The first type in which the outer areas (B in the text-figure) is brown and the inner area green may be associated with certain other observations.

The outer area of this type will usually be found to be relatively dry and withered. A few observations made in the laboratory, in which the dry weights of the areas have been obtained separately, would suggest that area B in this type has a lower water content than the A area in this type or than either area in the second type distinguished.

This suggests, therefore, that the brown colouration is due to withering consequent on loss of water. Yapp, in his extensive series of observations on Marsh plants and notably in his intensive study of *Spiraea Ulmaria* (*Annals of Botany*, Vol. XXVI., p. 815, 1912) has drawn attention to this type of discolouration, and pointed out the fact shown by the text-figure, that it proceeds more rapidly in the region between the veins. This is obviously to be expected, the area lying at the dividing line between two distributing systems is likely to feel first any shortage of water, while areas along the main veins, nearer the sources of water supply, will suffer least and remain green the longest.

The explanation of the second type of colouration is not at first sight so obvious. But reference to the literature has shown that it has been fully described and explained by Stahl (*Zur Biologie des Chlorophylls*, Jena, 1909, published by Gustav Fischer) who has supported his explanation by simple and ingenious experiments.

In this type the central portion of the leaf, frequently but not always including the main veins, becomes yellow first, the outer portion remaining green, the green colour persisting over a wider margin in the region between the main veins. This yellow colouration is, as a rule, quite distinct from the brown marginal discolouration of the first type, and is not associated with any relative loss of water. Stahl showed good reason for thinking that the change in colour is due to

the decomposition of chlorophyll while the yellow pigments, associated with chlorophyll in the leaf, retain their colour. The decomposition products formed from the chlorophyll, together with other valuable organic and inorganic substances present in the leaf, move off down the veins into the stem, whence they pass on to be stored in the persistent portion of the plant, whether seed, tree trunk, underground rhizome, etc., and thus are not lost to the plant when the leaf falls. As these products move away from the leaf, the decomposition of the pigment continues, and Stahl's experiments show convincingly that if the removal of the products from the leaf is prevented the colour change is frequently much delayed, although it usually ultimately takes place. Thus leaves of the same node were placed within the same moist chamber, one still attached to the plant, one removed. The detached leaf remained green long after its fellow had become yellow. If a circular portion of a still green leaf is cut out from the rest by a cork borer, this portion remains green longer than the rest of the leaf, both portions being kept under otherwise identical conditions. If the veins supplying and evacuating one area of the leaf are cut or if their action is impeded by the pressure produced by folding this portion of the leaf, in many leaves the leaf area connected with this portion of the network of veins remains green when the rest of the leaf is yellow.

These experiments were not successful with all Plants, Dicotyledons usually showing the phenomenon more readily than Monocotyledons; successful experiments are recorded with the following plants among others: species of *Quercus, Acer platanoides, Betula verrucosa, Robinia viscosa* and *R. pseudacacia.*

Stahl's observations and experiments, then, suggest that in Autumn, in many plants, chlorophyll is decomposed, and the products of its decomposition transferred from the leaf before its fall, to be used again in some other part of the plant. The leaf then usually appears yellow (Stahl notes cases where it is instead white, and as we shall see later, red shades of colours are possible) owing to the yellow pigments associated with the chlorophyll in the leaf remaining undecomposed.

Stahl explains the difference in the fates of these two groups of pigment on the grounds of the difference in their composition; the green pigments of the leaf containing nitrogen and magnesium, in addition to carbon, hydrogen and oxygen, which alone are present in the yellow pigments. It is curious, however, that the analyses of fallen and attached leaves given by him, while they show a marked loss of nitrogen from the leaf prior to its fall, do not support his views in the case of magnesium, which seems equally if not more abundant in the fallen leaf.

More recently Meyer (*Flora*, 1918, p. 127) has studied the chemical changes in the leaf prior to fall, and reports that a series of reactions precedes this event. First insoluble carbohydrate, such as starch, etc., are hydrolysed to soluble form, and then carried away down the veins, hydrolysis of proteins and their removal follows, and subsequently the chlorophyll is decomposed.

In the light of these statements, then, the second type of leaf colouration is capable of interpretation, the gradual spread outward of a yellow area from the regions of the main veins indicating the gradual decomposition of the chlorophyll. If its decompo ition has to be preceded by the removal of other products, as Meyer suggests, we can see why it begins near the veins.

These regions, near the main channel of communication, would naturally be the first evacuated, the exit of the products of hydrolysis from other regions must wait until these veins, through which they have to pass, have cleared themselves of the materials disgorged into them from the nearer tissues. On this view we may expect that the zone between the two differently coloured areas will be a region where there is a great accumulation of these soluble products of hydrolysis, such as sugars, awaiting their removal when the transport system can cope with them.

Reference to the literature on the subject of Anthocyanin, which has been admirably summarised (Wheldale M., 'The Anthocyanin Pigments of Plants.' Chambridge, 1916) will show that no condition seems more likely to give rise to the production of the red pigments of the anthocyanin group than an accumulation of sugar.

We are accustomed to a galaxy of red tints in our Autumn colouration, but prior to 1919 the writer had not noticed as a common phenomenon a zonation in the occurrence of this tint, which he then found frequent in leaves of the hawthorn and the dog rose. These leaves had around the main vein in the centre a small yellow area, outside this a red zone, then a green zone, and finally, not always a complete zone, but marginal patches, brown. The explanation that obviously suggests itself in the light of what has been stated above is that the yellow centre area represents a region where carbohydrates and proteins have been removed and the chlorophyll decomposed (as described by Stahl and Meyer); outside this is a red area, where the cells are choked with carbohydrates and other products awaiting evacuation, and where, therefore, a production of anthocyanins has taken place. Outside this again, a region where the hydrolysis of these reserves is perhaps not yet complete, and finally at the margin, in some cases, before the evacuation of the

leaf has begun, water is failing the plant and withering has shown itself.

Only further observation can show whether this phenomenon is sufficiently frequent in occurrence to deserve explanation, and experiment and analysis will then be required to ascertain whether the explanation suggested above is in accordance with the facts; but it seems the natural extension of the statements of previous investigations to fit the observed phenomena, and it is hoped it may interest other naturalists sufficiently to cause further observations and still better, perhaps, further experiment upon the subject.

Two further points may be briefly noted in conclusion.

It seems a frequent occurrence for the leaves which are having their contents exhausted from the centre to show signs of withering at the margin, of yellow brown or black tint, and due apparently to loss of water, before the process of evacuation has reached this marginal region. These notes are being written at the end of August in what will probably be a vain endeavour to get them into print in time to stimulate some observers to action this autumn. But in this unfriendly Summer the leaves are already falling, and those so far examined show practically invariably the marginal zone of the first type, due to lack of water, with the inner zone still green.

Unless a warm September follows, it seems probable that in nearly all plants leaves will be withering before they fall, and before the normal process of evacuation of their contents has proceeded far if visible at all.

As stated earlier one of these two types of colouration seems characteristic and predominant as a rule in a particular species, the sycamore in Yorkshire in 1919 being an exception; both these types were noticed frequently in the middle of October in the sycamore, while in leaves that fell at the end of the month the yellowing outwards from the centre following evacuation had almost invariably proceeded nearly to completion.

But if plants do fall into two categories in this respect, the classification has a further interest in that leaf mould from leaves of the first category, which presumably have not been evacuated, should be richer than leaf mould from leaves of the second type which have been to a greater or lesser extent evacuated prior to fall. From the scanty 1919 observations, birch, sweet chestnut, wych elm, horse chestnut, oak, and alder are frequently in the first category (withering before evacuation); but oaks were difficult to generalise upon, and in alder the withering was so rapid that good zonation was hard to see. Beech, on the contrary, was nearly always in the second category, and the leaves only occasionally in 1919 showed the signs here taken as indicative of withering in a

green margin not yet absorbed into the yellow centre by the progress of evacuation. From the present standpoint, the leaf mould from beech should be less valuable as manure than leaf mould from the plants mentioned earlier. But the evidence is too slender yet to render generalisation of any value; the point is only raised in the hope of still further stimulating to further inquiry. Without doubt analyses will exist in the literature, which give data enabling a comparison to be drawn as to the value of different leaves for manure, and which can be used to test any observations along these lines, but the writer is not at present aware of them, and would be glad if any reader would direct his attention to relevant books or papers.

It is hoped that these notes will not be regarded as a record of observations, but as a record of interesting problems calling for inquiry and observation, and arising from a few cursory observations in a peculiarly favourable season. If the seasons permit, it is hoped by the writer that the many naturalists in Yorkshire will accumulate observation and co-operate in their solution by an exchange of views on the subject, and still better by devising experiments and recording the resultant data as a contribution to the elucidation of an interesting line of work. One point that must not be lost sight of is that the marginal withering, attributed in this paper to lack of water, assumes a physiological process, the mechanism of which is not clear. Why, for instance, in this miserably wet season towards the end of August, should leaves falling from the trees show marginal discolourations which are attributed to lack of water?

——: o :——

CORRESPONDENCE.

FRUIT-TREE DISEASES CURED BY BIRDS.

During this year there occurred here in Hartley, Kent, two well-marked cases where 'pests' on fruit trees were destroyed by birds. Early in March, a Black Currant bush, about 3 feet high, was speckled with grey all over. On close examination the bush was found to be infected with scale disease—about eighty scales were still attached to the boughs; the speckling being where about three hundred scales had been removed by some birds. Chaffinches, Blue Tits, and Great Tits were frequently round the bush before it was rooted up and burnt; probably the latter two did most, if not all. The second case was an Apple tree, about 4 to 4 ft. 6 ins. high, which was infested by Woolly Aphis in June a patch about as large as a shilling rapidly appearing in a few days. Being busy otherwise, it became necessary to leave the 'pest' to the birds, no artificial remedy being applied to the bark of this Allington Pippin. It had quite disappeared within 2 to 3 weeks, and there is at present (Sept. 4th) only a stain to show where the disease previously was. The tree carried thirty-seven apples on that day, all sound and healthy.—Frederick D. Welch, M.R.C.S.

NORTHERN NEWS.

A record of the *Wryneck* in Westmorland appears in *British Birds* for July.

The Geological Society of London has published its *Abstracts of the Proceedings*, Nos. 1043-1058, with index, 96 pp., price 6s.

The book referred to on p. 274 as 'Wild Flowers and How to Know Them' should have been 'Wild Fruits and How to Know Them.'

Part XXII. of S. S. Buckman's *Type Ammonites* contains illustrations and descriptions of *A. tenuicostatus* from Whitby and *A. buckii* and *A. retentus* from 'R. H. Bay.'

In a review of 'The British Association at Cardiff,' *Nature* for September 2nd quotes a letter from Dr. R. V. Stanford, which should be read by all interested in the future of the Association.

In the *Journal of the Ministry of Agriculture* for September, Mr. A. D. Cotton writes on 'How to protect Wheat: some Notes on Fungus Pests.' There is also a paper on Insect and Fungus Pests in September.

The Report of the Colchester Museum for the two years ending March 31st, 1920 (34 pp., 6d.) contains the usually remarkable record of valuable additions to that fine museum, with several plates from photographs by the curator, Mr. A. G. Wright.

Referring to the remarks in our September issue, pp. 279, respecting zoological bibliography and references to papers, our readers interested should refer to a paper by our greatest expert on these subjects, which appeared in *The Naturalist* for January, 1908.

The Transactions of the Entomological Society of London, issued July 26th, contain 'Notes on the Biology of some Inquilines and Parasites in a nest of *Bombus derhamellus* Kirby: with a description of the Larva and Pupa of *Epuraea depressa* Illig. (=*aestiva* Auctt.): Coleoptera, Nitidulidae,' by Dr. Hugh Scott.

The Mineralogical Magazine for September contains an interesting account of various minerals on fused lead from the wreck of the fire-ship *Firebrand*, in Falmouth Harbour, the ship having been burnt about 1780. Dr. Prior writes on 'The Classification of Meteorites,' and there are the valuable 'Mineralogical Abstracts.'

The New Phytologist, issued on August 24th, for 'July and October'! contains 'Hybridism and Classification of the genus *Rosa*,' by J. R. Matthews; 'Mutations and Evolution,' by R. R. Gates; 'The Mechanism of Root Pressure,' by J. H. Priestley; 'Methods and Significant Relations in the Quantitative Analysis of Plant Growth,' etc. (pp. 153-212, 5s.).

We should like to congratulate Messrs. W. H. Mullens, H. Kirke Swann and F. C. H. Jourdain on the completion of their remarkable 'Geographical Bibliography of British Ornithology,' which many will use, but few will acknowledge! Part 6 (pp. 481-558, 6/-) concludes the volume. It contains a few Scottish entries, all the Irish lists, and a few additional records which have come to light while the work was going through the press.

We have received from the Rev. E. A. Woodruffe-Peacock the 'Botanical Report' (24 pp.), reprinted from *The Transactions of the Lincolnshire Naturalists' Union*. The Report is more than the name implies, being descriptions of the various species of plants, and the way their seeds may be dispersed by birds. The 'methods of transportal' are given as:—I.—Internal Seed-Carriage—(1) In the Crop, (2) In the Gizzard, (3) In the Alimentary Canal; II.—External Seed-Carriage—(4) In the Mud, (5) In Clay-balls, (6) Amid Ruffled Feathers, (7) By Mucosity; III.—External Portion of Plant-Carriage—(8) On the Backs, (9) Round the Necks, (10) On the Feet.

JUST PUBLISHED.

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London. Oct. 1st, 1920.

NOV. 1920. No. 766
No. 540 of current Series

THE NATURALIST

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

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

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

Contents :—

LONDON:
A. BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.

Printers and Publishers to the Y.N.U.

Price 9d. net. Prepaid Subscription 8/6 per annum.

BOOKS FOR SALE.

British Non-Marine Mollusca. Swanton. 1/6
Lessons on Shells. 1/6
Astronomy, Clerke, Fowler and Gore. 4/-
Beasts, Birds and Bees of Virgil. Royds. 2/-
Rust, Smut, Mildew and Mould. Col. Pls. Cooke. 3/-
The Animal World. Gamble. 1/-
Reptile Life. Pycraft. 2/-
The Nature Lovers' Handbook. Kearton, etc. 2/6
History of the Oxford Museum. 2/6
Medical Contributions to the Study of Evolution. Adami. 7/6
Fourth International Ornithological Congress, Proc. 1905. 10/-
Evolution in the Past. Knipe. Pls. 7/6
Aristotle's Researches in Natural Science. Lownes. 4/6
Turner on Birds. 1544. Evans. 5/-
Reptiles and Batrachians. Boulenger. Pl. 10/6
Darwin and the Problem of Life. Gunther. 7/6
Growth and Form. Thompson. 15/-
Waves of the Sea. Cornish. 5/-
Waves of Sand & Snow. Cornish. 5/-
Life of Crustacea. Calmen. 5/-
Plant Life in Alpine Switzerland. Arber. 4/6
A Picture Book of Evolution. 2 Vols. 2/6 a vol.
Conditions of Life in the Sea. Johnstone. 5/-
The Further Evolution of Man. Calvert. 4/-
Life and Evolution. Hedley. 4/6
Harmsworth Natural History. 3 Vols. 10/- each.
Lessons from Nature. Mivart. 4/-
Heredity. Thompson. 5/-
Darwinism and Human Life. Thompson. 4/6
Wild Traits in Tame Animals. Robinson. 4/6
The Lessons of Evolution. Hutton. 2/6
Hills and the Vales. Jefferies. 4/6
Animal Life under Water. Ward. 5/-
The Open Air. Col. Pls. Jefferies. 4/-
The Chrysanthemum. F. W. Burbridge. 2/6
Hunting in British East Africa. Madeira. 7/6
Spencer Fullerton Baird. By Dall. 7/6
The Greatest Life. Leighton. 3/-
The Yorkshireman. By a Friend. Vol. I., Pontefract, 1833. 3/6
Derby: Its Rise and Progress. Davison. 2/6
Animal Romances. Renshaw. 4/-
The Scientific Enquirer. Cloth. Vols. I. and III. 2/- each.
The Making of Species. Dewar and Finn. 4/-
Rambles of a Canadian Naturalist. Coloured Illust. S. T. Wood. 3/6
How to Lay out Suburban Home Grounds. Kellaway. (Pubd. at 8/6). 3/6
What is Instinct ? C. Bingham Newland. 2/6
Vigour and Heredity. J. Lewis Bonhote. 5/-
Mendel's Principles of Heredity. Col. Pls. Bateson. 5/-
'The Suk' Language and Folk-lore. Beech. 3/6
Animal Life and Human Progress. Dendy. 6/6
The Heron of Castle Creek. Rees. 4/6
Meteorology for All. Horner. 3/-
Wonders of Insect Life. Crabtree. 3/6
Familiar History of British Fishes. Buckland. 2/6
Glimpses of Nature. Wilson. 2/6
Comparative Anatomy of Animals. Huxley. 4/-
Anatomy of Vertebrated Animals. Huxley. 2/6
Flora of the British Isles. Hooker. 3/6
Crustacea and Spiders. Skuse. 1/-
Life in the Sea. Johnstone. 1/3

Published Records of Land and Fresh-Water Mollusca, East Riding. (Maps). T. Petch, B.Sc., B.A. 1/6

Apply—**Dept. C, c/o A. BROWN & SONS, Ltd., Hull.**

NOTES AND COMMENTS.

TITLES OF PAPERS.

As we are among the few unfortunate individuals who undertake bibliographical work, we should like to appeal to contributors to journals, and particularly to editors, to insist on seeing as far as possible that the title of a paper is some indication of the nature of its contents, for if a bibliography is to be of service at all, it must, in addition to giving the titles of papers, indicate to what they refer. Thus when Natural History and Archæological articles are headed 'A Find'; 'A Puzzle'; 'A Combat'; 'Battle Royal'; or 'A Curious Find' these headings have necessarily to be quoted, in addition to which the bibliographer must insert what should have been the correct title to the paper, in this way considerably adding to the amount of work and the cost of printing. Authors, and especially young ones, may be pardoned for making errors of this sort, but editors should be able to put them right.

UNNECESSARY VARIATION.

There is a further difficulty to be contended with, which should be corrected, as the habit is growing more prevalent in our scientific journals. As far as possible the title should be brief and clearly convey the subject of the article. For instance, a student searching for records, say, of the Marten in Shropshire, could easily search through the lists for a heading 'Marten in Shropshire.' Judging, however, from titles examined during the past few weeks, the record might easily occur under 'On'; 'Notes on'; 'Stray Notes on'; or even 'Memorandum of'; 'The Occurrence of'"; or "Record of' a Marten in Shropshire, or many other varieties. It seems unnecessary to head a record 'Notes on' or 'Record of' as this is obvious. Another means of causing extra work and expense is the way in which authors appear under various names. In one journal with which we are familiar, during the last few months notes have appeared by a welcome contributor as, say, by 'C. T. J.'; 'C. T. Jones'; 'Chris T. Jones'; or 'Chris. Thomas Jones.' Had they all appeared under C. T. Jones or Chris. T. Jones, one entry of the name would suffice, and the various contributions could have been kept under alphabetical or datal order. Another means of causing unnecessary confusion or search is when two authors who regularly write conjointly change the names about, and one month is 'Smith and Jones,' and the next 'Jones and Smith.' Consistency would be an advantage all round. It is obvious there should be consistency, as when, as happens in one well-known journal, each joint author has three long names, which are given in different forms, and sometimes one

set is placed first and sometimes another, the numbers of references and cross-references become irksome.

' DOUBLE '-NUMBERS.

Another source of inconvenience when quoting references is the growing habit of issuing what are described as ' double numbers,' and are consequently double the usual price, presumably because they appear bi-monthly instead of monthly. There is not much objection to the words ' double number ' appearing on the cover for the benefit of the publisher and for the enlightenment of the subscriber, but when both months are named and both parts to the Volume are indicated, and when every issue is a so-called ' double number,' the question of giving proper reference becomes exceedingly complicated, quite apart from the time and space occupied. One publication recently received is for July and October, but was ' published August 24th.' It is also Nos. 7 and 8 of the volume, and a ' double number,' although it only contains 24 pages. It is difficult to see what objection there can be to numbering each part separately, and adding the month of publication. If, as in the case of some societies' publications, the journal is behindhand in its issues, there is no difficulty in adding that it is issued for such a month of such a year. This need not interfere with the actual number of the volume or part or date.

SHEFFIELD MUSEUM AND BABIES.

After having sent well over a hundred publications to the Sheffield Museum during the past twenty years, in exchange for an occasional report issued by the Sheffield Institution, we naturally assumed that its recent report, a pamphlet of 35 pages, covering the years 1914-1919, would have been sent to us in the usual way. After applying, we were eventually told by the Curator that on account of the demand for this report it was not possible to send them to ' outsiders,' consequently he could not oblige us. However, we have managed to get one, and we must say that something seems to have happened in the city of Sheffield ; for after the very serious matter-of-fact reports, with bare lists of additions, etc., which have been issued by the Sheffield Museum, we suddenly find that the Curator has taken an extraordinary interest in babies, and quite a large proportion, certainly more than the report of any one year's work, is occupied by paragraphs headed, in large black type, ' Mistakes often made in General Management of Baby during the first Week ' ; ' Baby Food ' ; ' Baby's Lungs ' ; ' Picture of a Cow being milked by a Stranger ' ; ' Baby, aged three years ' ; ' Calf, aged three years ' [' some ' calf !] ; ' Exhibition of Baby Clothes ' ; ' Baby's Cot,' and so on. Apparently this is one result of a ' Baby

Week,' but in other towns the Museums have issued separate pamphlets or handbooks on this subject. Certainly we did not expect to find this unusual prominence given to babies. One wonders why? Particulars of Gifts, Purchases, Loans, etc., are printed in smaller type.

FILMING WILD BIRDS.

We take the following from an article on ' Filming Wild Birds,' which appears in a recent issue of *Discovery*. We presume there is no reason to doubt the statement made, but really ' seven weeks ' seems rather a long time to prepare a photograph. ' But one futile attempt did not daunt this enterprising young man, for he next procured another camera and attached it to the same floating base. Day after day he waited for the regular appearance of his victim, when he turned the handle of the second camera, which was without any film. *This went on for seven weeks*, at the end of which time the kingfisher had learnt to pay no attention to the working of the motion-picture machine. All he had to show for his untiring efforts was a strip of film two hundred feet in length. Snappy, it is true, but it was run off the screen in two minutes.'

DOWSING.

From an editorial in the same journal we learn that ' A dowser is a man with very special powers. He takes a forked hazel twig, and with the point of the twig upwards and a fork lightly held in each hand, he perambulates in a business-like manner over the country in a search for underground water or ore. At certain places, sometimes there is an unconscious and involuntary movement of the dowser's muscles which causes the twig to twist, and at these places is found the ore or the water which is sought. If any reader has not heard previously of water-divining, or dowsing, we may say that, if he asks us the question, " Do you mean to tell me that a man, by walking about with a piece of wood in his hands and waiting till it twists, can locate water? " our answer is " Yes." The fact seems well established. It is the explanation of the fact that is the difficulty, and which is rightly the concern of psychical research.' Against this there is the famous test already referrred to in this journal, where some dowsers were taken blindfold and placed on a grass covered reservoir, and not one of them detected that there was water beneath. The writer in *Discovery* admits that ' it is *difficult* to say what connection there can be between a man with a piece of wood and an underground well.' We think it is *impossible*.

AN AMERICAN OPINION.

Contrasting with the pious opinion of the editor of *Discovery* is a notice in *Nature* of ' The Divining Rod,' a volume recently

issued by the United States Geological Survey :—' The origin of the divining rod is lost in antiquity, but a belief in its value for a variety of purposes has persisted until the present day. The United States Geological Survey considers that for all practical purposes the matter is thoroughly discredited and of no value whatever in locating either water or mineral ores.'

THE BRITISH ASSOCIATION.

In No. 2655, *Nature* again refers to the future of the British Association, in a well-timed leading article which deserves careful perusal and consideration. One point we should like to emphasise. ' Unlike other societies and institutions, the British Association looks for members and support to the public in the locality in which its annual meeting is held. It cannot expect, however, to meet with the response desired unless it does much more to create and foster interest in local and national subjects with which science may be concerned, and by securing for the meetings the presence of prominent public men. Distinguished statesmen, great captains of industry, and leading representatives of labour should be approached, and we believe that many of them would be glad to range themselves on the side of scientific workers and testify to the national significance of contributions to national knowledge. There is no lack of subjects with which such men may be appropriately associated. What is lacking is the eloquent advocacy which well-known public men can give.'

THE VASCULUM.

The July issue of this publication is remarkably good. The general editor, Rev. J. E. Hull, writes in defence of Blackwall's ' Spiders of Great Britain and Ireland,' and on ' Natural Features in Local Place Names ' ; H. St. J. K. Donisthorpe on ' Distribution of British Beetles,' J. W. H. Harrison on ' More Abnormalities in Plants,' and G. W. Temperley and R. B. Cooke on the ' Flora of Upper Teesdale.' Mr. G. Bolam writes on ' The Polecat in Durham ' ; A new bird [Little Owl] for the local list, etc., and there are the usual notes and criticisms.

DESTRUCTION.

Under the familiar initials G.B., are some characteristic remarks on the Destruction of Rare Birds and Mammals. From these we learn that ' the *Annual Report of the Zoological Society of Scotland* for the year ending 31st March, 1920, recently published, contains an appeal from the Council to Fellows for British and particularly Scottish animals, not merely for the purpose of exhibition in the Society's Park, but *for export* in exchange with Societies abroad. Included amongst the animals especially asked for are Wild Cats, Martens, Polecats, Peregrines,

Eagles, Buzzards and Owls, as well as any sea-birds, shore-wading, and moorland-birds. Yet on the Council making this appeal are the names of leading naturalists, some of them members of the Departmental Committee whose Report to Parliament we recently commented upon, and which Report makes strong recommendations for the fuller protection, *all the year round,* of some of the birds above mentioned ! Are we to conclude that scientists and legislators are no better than poor common folk who would occasionally, it is said, like to have it both ways ? Or how is the law to be enforced upon the people to whom such examples are publicly advertised ? '

MILLSTONE GRIT.

Dr. A. Gilligan's paper on ' The Petrography of the Millstone Grit of Yorkshire,' already referred to in these columns, appears in part 300 of the *Quarterly Journal of the Geological Society* recently issued. It is accompanied by four plates of sections of pebbles, and a map ' showing probable distribution of Land and Water in the Millstone Grit Period.' Land is shown in north Scotland and the west of Ireland and in the English Channel, there is a small island in the Lake District, and a large one stretching across the Irish Channel, Wales and on to Norfolk. The streams forming the delta in which the grit was deposited occur in the water between the north Scotland and Wales-Norfolk land masses. Dr. Gilligan states that he has followed Sorby's methods of investigation, and though he has extended Sorby's field, the results of Dr. Gilligan's enquiry ' corroborate in a remarkable way the conclusions arrived at by that eminent geologist.'

LAKE DISTRICT GEOLOGY.

The Proceedings of the Geologists' Association, Vol. XXXI., part 3, contains Mr. J. F. N. Green's Presidential Address on the ' Geological Structure of the Lake District,' which is accompanied by numerous maps and diagrams. In this he concludes, ' The effect of the Tertiary folding and faulting which, as Prof. Kendall has shown, sometimes followed Hercynian lines of weakness, was to produce a broad curved synclinal and anticlinal structure. The centre of the former is represented by the Eden Valley Permo-Trias, the structure, though largely due to faulting, being synclinal in character. The axis is curved, north-west south-east in the north, but bending round to a direction nearer west-east. It continues eastward and east-north-eastward, through the coal-measure fragments of Brough-under-Stainmore and Ronaldkirk (near Barnard Castle), into the south of the Durham coalfield. The Lake District inlier is in the core of a parallel anticline, curved in the same manner. The lower palæozoic rocks are cut off to the east-south-east by the Dent fault, but the anticline,

broken by the Craven fault, continues eastward, bringing up the Ingleton and Horton inliers of Lower Palæozoic rocks, and can be followed past Pateley Bridge in Nidderdale. The great breadth of the Lake district inlier across the strike of the Tertiary axis is largely due to two episodes in its earlier history; firstly, the denudation of much of the Carboniferous in Permo-Triassic times; secondly, thinning-out of the lower Permo-Trias against the older rocks. Otherwise it does not differ essentially from the other smaller inliers of the north-west of England. The Tertiary movements may not yet be complete. The Carlisle earthquake of 1901 was calculated by Dr. C. Davison to be due to movement along a fault near Grasmere, with direction N. 5° E. This looks like renewal of a Hercynian fracture.'

AUTUMN.

The days are growing shorter, nights are cold:
Summer is fled;
The leaves fall silently upon the mould
Withered and dead.

The migrant birds that brought the early spring
Oceanwards fly,
And no more butterflies are on the wing:
Winter is nigh.

S. MATTHEWMAN.

——: o :——

Achatina acicula feeding on potatoes.—Many of the potatoes in my garden, which has a wet clay soil, are considerably 'slug-eaten,' and in taking a slug out of one I found in the same hole a live *Achatina acicula* feeding on the potatoe.—J. T. SEWELL, Whitby.

A Cynipid Gall new to Yorkshire.—On September 23rd Mr. M. L. Thompson and the writer paid a visit to the Grangetown Slagheaps and the sandhills to the south of the River Tees. I was pleased to find a few galls of *Aylax taraxaci* Ashm., on Dandelion. This species is new to the Yorkshire List and was introduced to the British Fauna by Mr. Bagnall on specimens from Penshaw Hill, Durham (*Ent. Mo. Mag.*, 1917, p. 200). Mr. Bagnall's note enabled me to identify a gall which I had taken at Eyam, Derbyshire, in 1902, as that of the same species (see *Ent. Mo. Mag.*, 1917, p. 237). The galls of a chalcid (probably *Eurytoma hyalipennis* Walker) were fairly abundant on Marram Grass on the sandhills. This is recorded from Saltburn in the Vict. County History.—WM. J. FORDHAM, M.R.C.S., L.R.C.P., F.E.S.

Naturalist,

THE MILLSTONE GRITS WEST OF HUDDERSFIELD.

W. S. BISAT.

THE excursion of the Leeds Geological Association on July 10th to Meltham and Marsden provided a welcome opportunity for the detection of marine bands in the Millstone Grit series of that area, and an examination of their fauna.

Previous records from this and other districts were summarised by Dr. Wheelton Hind in his paper on ' Life Zones in British Carboniferous Rocks ' (*The Naturalist*, 1907, p. 90 *et seq.*), where faunas collected by Barnes and Holroyd are described from the following localities :—

(1) The Marsden tunnel on the L. & N. W. Rly. (p. 90 *op. cit.*).

(2) A grit quarry on Pule Hill, Marsden (pp. 91, 92, *op. cit.*).

(3) Holt Head, near Slaithwaite (p. 94, *op. cit.*).

There is also a record by J. R. Simpson in *The Naturalist* (Nov., 1916), on Fish and Molluscan Remains from Shales below the Rough Rock at Brockholes. See also Wellburn (*P. Yks. Geol. Soc.*, Vol. XIII., pp. 395 *et seq.*) for details of fish records. For stratigraphy see *Mem. Geol. Survey on Yorkshire Coalfield*, pp. 47-63 and 528-540 ; and the Geol. Survey maps.

On the present occasion examination of the sequence was limited by time and inclement weather, but by the aid of the intimate local knowledge of Dr. Woodhead, marine shales were recognised in nine localities, at probably five different horizons.

In descending order the exposures seen may be summarised as under :—

(1) *Shales under Rough Rock.*—Clay shales at this horizon are seen at Dolly Folly Fault, half a mile north-east of Meltham. The fault throws 3rd Grit against these shales, the grit at the fault line forming a waterfall about thirty feet high in the course of Folly Dike, a tributary of Hall Dike. On the low side of the fall a mass of clay shales is seen dipping steeply downstream, and these are well exposed on the south bank. About fifteen feet down stream from the fall, a ledge about two feet wide in the shale scarp dips down to the stream, and fossils may be obtained about one to two feet above this ledge. Here were collected :—*Gastrioceras listeri, Pterinopecten papyraceus, Posidoniella lævis.*

A specimen of *listeri* showed well reticulate ornament near the aperture. This feature was also preserved in specimens from the same horizon at Cold Edge, near Halifax.

At West Nab clay shales above the Upper Meltham Coal

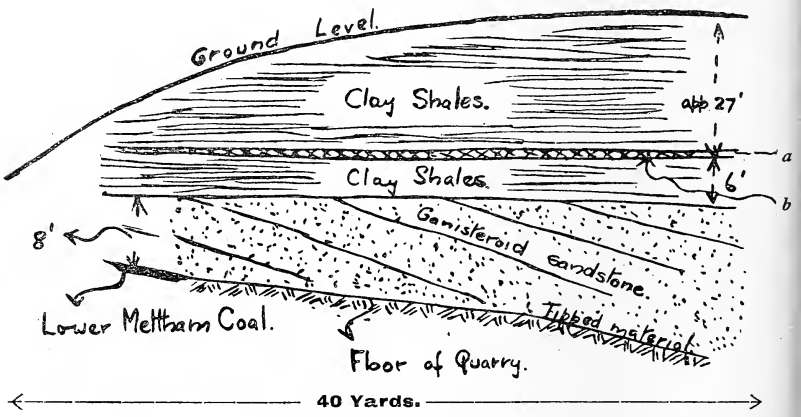
are exposed near the old coal workings in the banks of a stream which crosses under the road coming down from the shooting box. These shales rest on a rubbly carbonaceous sandstone, and contain occasional lamellibranchs, species not yet determined. Permission to examine the exposures on these moors was granted by Mr. Edgar Hirst and Messrs. C. F. Mallinson & Son.

(2) *Shales under Rock 'A' of Survey.*—These were seen in two localities :—

(*a*) In borehole cores at Brow Grains.

(*b*) Overlying the ganister quarry on Royd Edge.

(*a*) Borings for water have recently been put down by the Huddersfield Corporation Waterworks Department at Brow Grains, west of Meltham, and by the permission of the Waterworks Manager, Mr. J. W. Armitage, the cores were examined.



Section in Banister Edge Quarry.
a—Fossiliferous band. *b*—Ochreous stain exudes from under.

The site is on the north bank of Muddy Brook, at about 880 ft. O. D., and the borings passed through beds of sandstone representing Rock 'A' and penetrated the shales underlying them. A portion, at any rate, of these are clay shales of a marine type, containing at one horizon the following fauna :—*Glyphioceras bilingue* (abundant and well preserved), *Pterinopecten papyraceus, Posidoniella lævis, Orthoceras* sp.

(*b*) At the west end of Royd Edge, termed Banister Edge on the 6-in. map, is a ganister quarry with a heavy clay shale bearing. The section is interesting, as there appears to be a definite unconformity between the ganister and the overlying shales. The clay shales are not very fossiliferous, though they contain an occasional lamellibranch, but at about 6 feet above the top of the ganister there is a

very soft black earthy band in the shale, crowded with *Glyphioceras bilingue*. The position of this band may be easily picked up by the ochreous stain seen oozing out at intervals along its base. The fauna includes :—*Glyphioceras bilingue* (luxuriant), *Goniatite* sp., *Posidoniella lævis* and *Pterinopecten papyraceus*. The Lower Meltham Coal is seen some distance down in the ganister.

At Holt Head, between Slaithwaite and Meltham, on the west side of Bradley Brook, at 875 ft. O.D., is an old ganister quarry, now unfortunately filled in, and the sections buried. Clay shales in the tip show traces of goniatites. In the stream hard by are good sections in the same shales, with ganister rock and impure coal underlying them.

It seems likely that this exposure is on the same horizon as the two previous ones (with *G. bilingue*), but naturally nothing can be stated till an opportunity occurs to examine the shales and collect a fauna from them.

(3) On the west side of the road dropping down from Holt Head to Slaithwaite, is a quarry the summit of which is at about 775 ft. O.D. The approximate section is:—

Grassed slope with tumbled rock showing at base	25 ft.
Black shales, traces of fossils	10 ft.
Hard black carb. band	2 ins.
Pale shale with carb. marks	7 ft.
Massive sandstone rock	20 ft.

Nucula aequalis was obtained from the 10 ft. shale band, and there are also small earthy nodules in these shales which might yield fossils if searched carefully.

(4)—(*a*) Still further down the road towards Slaithwaite is a disused ganister quarry, on the east bank of the stream (Kitchen Clough). The top of the quarry is at 560 ft. O.D., and the approximate section is:—

Soil and flood gravel composed mainly of large ganister boulders	5 ft.
Somewhat greasy black shales with bands of small (up to 3-in.) earthy nodules ...	15 ft.
Hard ganister	7 ft.

The shales are fossiliferous, and the small nodules contain—*Glyphioceras reticulatum* (abundant, both young and adult, and well preserved in the form of external casts), *Posidoniella lævis*, a gasteropod, and a lamellibranch.

(*b*) Similar greasy shales with the same small earthy nodules containing *Glyphioceras reticulatum* were seen above Ox House at the east foot of Wessenden, at about 840 ft. O.D. The fauna is not so luxuriant as near Slaithwaite, but it seems probable that the horizon is the same in both places.

(5) At the east end of Butterley Reservoir embankment is a fine exposure showing sandstones and intermediate shales

rising steeply upstream. These beds may be well studied from the road, and the beds more readily accessible show a section approximately as under :—

Thick rock	30 ft.
Bands of wedge-shaped rock intercalated in shales	15 ft.
Black shales	11 ft.
Thin coaly band.	
Pale grey shales with carbonaceous marks.	

Lingula mytiloides is present in fair abundance about 8 ft. up in the 11 ft. of black shales, and associated with it are also occasional lamellibranchs.

This is apparently the lowest marine horizon recognised, though lithologically the section is not unlike that seen at (3) (see *ante*). The horizon, however, can hardly be the same unless there is an unrecognised fault between Butterley Reservoir and Ox House with a downthrow to the north.

Dr. Woodhead has obtained possession of sections of the strata passed through in the sinking of the trench for the core wall of Butterley Reservoir, and from these I extract the following average section of these lower beds in the hope that it may prove of use :—

G.	Sandstone.	
F.	Shales and thin sandstones	80 ft.
E.	Sandstone, false bedded	39 ft.
D.	Shales with sandstones	53
	(A thin sandstone at 16 ft. down is very constant.)	
C.	Massive sandstone	42 ft.
B.	Shales	59 ft.
A.	Massive sandstone	57 ft.
	Sandstone bands	39 ft.

The bed ' A ' reaches the surface just below Blakeley dam, and dips to about 160 ft. below ground at Butterley dam. Apparently the marine band seen by the roadside lies in the beds ' F,' though this is not quite certain.

One striking peculiarity in the Millstone Grit sequence in the Meltham-Marsden area is the unusual prevalence of marine shales, and of ganisteroid sandstones. An opinion, of course, may be unduly influenced by accidental exposures, but one effect of river erosion is perhaps worth pointing out, as lending colour to the suggestion that the shale beds in this area are unusually soft.

On examining a map of the district, it will be noticed that the Colne sends out at Marsden an abnormally long feeder—the Wessenden—stretching south-eastwards along the strike far into the hills, and capturing what must at one time have been the headquarters of Hall Dike. Wessenden is carved out of Middle Grit shales, and I conclude that the unusual magnitude of the valley reflects the decided softness of the rocks cut through.

The inability of Hall Dike to hold its own is due to the trough in which it lies, and as a result of which the Middle Grit shales lie at such a comparatively deep level that the stream has only very partially broken through to them.

The hill area from Todmorden to Holmfirth forms one physiographical feature, consisting of seven valleys all running south-westwards into a range of hills stretching north-west to south-east. This hill and valley system extends to the south-east as far as Sheffield, but south of Holmfirth the whole of the streams have been captured by a strike tributary of the Sheaf * and pulled round to the south. Numbering the above seven streams from the south we have—(1) Holme, (2) Hall Dike, (3) Colne, (4) Black Brook, (5) Ryburn, (6) Turvin Clough, (7) Calder. Of these valleys we have been discussing above the grit sequence of Nos. 2 and 3. The zonal goniatites seen, as stated in detail above, are in descending order :—*Gastrioceras listeri, Glyphioceras bilingue, G. reticulatum.*

In valley No. 1, that of the Holme, the same sequence was seen last year on the occasion of the visit of the Yorkshire Geological Society, and it seems desirable to give details of the faunas collected in that area, for comparison.

(1) Base of shales under Rough Rock Flags in Reaps Dike, west of Reaps Scar, Snailsden Pike :—*Gastrioceras listeri* (dominant), *Glyphioceras reticulatum* (occasional), *Pterinopecten papyraceus, Posidoniella lævis, Glyphioceras davisi.*

(2) Shales in Ramsden Clough under Rock ' B ' of Survey. About 70 ft. below ' B ' and 15 ft. above a sandstone rock weathering with rounded edges. Exposure on west bank of stream at about 1,300 ft. O.D. in clay shales :—*Glyphioceras bilingue* (dominant), *Coelonautilus* sp., *Pleuronautilus* sp., *Glyphioceras* sp., *Orthoceras* cf. *steinhaueri, Pterinopecten papyraceus, Posidoniella lævis, Lingula mytiloides, Aviculopecten* sp.

The same horizon was seen in Rake Dike (south-west of Holme) at 1,550 ft. O.D., but only *Lingula mytiloides* and *Orbiculoidea nitida* were observed, although the clay shales and sandstone with rounded edges were both very similar to the exposure in Ramsden Clough.

(3) A lower horizon in Rake Dike is in clay shales on the top of a grit band forming at waterfall at 1,250 ft. O.D. Here were seen :—*Glyphioceras reticulatum* (abundant and finely preserved), *Posidoniella lævis* (rare), *Dimorphoceras gilbertsoni* (occasional).

(4) A still lower marine horizon in Rake Dike is at about 200 yards above the road, at 1,110 ft. O.D. Here in a rather

* Lower-Carter, ' Evolution of the Don River System ' (*Proc. Yorks. Geol. Soc.*, Vol. XV., p. 388 *et seq.*).

sandy clay shale above a grit referred by the Survey to the Kinderscout was seen *Glyphioceras reticulatum* fairly abundantly and definitely, but no other fossil.

I must express thanks to Dr. Woodhead for his kindness in showing me round the area, and for pointing out exposures. I feel sure that, stimulated by him, the local workers of Huddersfield will ere long solve the faunal sequence of their Millstone Grits.

——: o :——

Helmsley Mollusca.—During the Fungus Foray held at Helmsley in September, I noted the following species of mollusca:—*Helix aspersa, H. nemoralis* var. *carnea* (00300), *H. hortensis* var. *lutea* (00000), *H. arbustorum, H. itala* var. *minor, H. fusca, H. hispida, H. rotundata, Hyalinia lucida, H. cellaria, H. alliaria, H. nitidula, H. pura* and var. *margaritacea, H. fulva, Ena obscura, Clausilia laminata, C. bidentata, Pupa umbilicata. Azeca tridens* and *Zua lubrica. Arion ater* and several other slugs were also observed, but the common little grey slug *Agriolimax agrestis* did not appear to be in such profusion as in other localities recently visited.—Greevz Fysher.

Cumberland Hepaticae.—Among a number of recently gathered Hepatics, are two which do not seem previously to have been recorded from Cumberland (V.C. 70). In May I found a very red-coloured plant growing in holes in a peaty hedge-bank, near the village of Little Orton. When examined at home under the microscope, I made it into *Lophozia porphyroleuca* (Nees.) Schiffn. In July I found *Conocephalum conicum* (Linn.) Dum., growing on wet rocks in Roughtin Gill, in the Caldbeck district, and in fine fruit. Mr. W. H. Pearson, to whom I sent specimens of both plants, writes that he had previously found the *Conocephalum* growing not uncommonly in Borrowdale.—Jas. Murray, 2 Balfour Road, Carlisle.

Silver-striped Hawk Moth in Scarborough.—A male *Hippotion celerio* L. was taken in a fruiterer's shop in Scarborough on October 7th. There is only one previous record of its occurrence here, a female, taken by Mr. D. W. Bevan, on a door-post in Lyell Street, on 13th September, 1917. This second specimen, except for a certain amount of denudation of the wings—to some extent at least due to confinement in the box in which it was brought—is in good condition. The locality in which it was found suggests that it was accidentally imported with foreign fruit, etc., but this possibility is present in the case of many species which are of sporadic and rare occurrence in Britain, even if, as in the case of Mr. Bevan's specimen, they have actually been captured in the open air.—Geo. B. Walsh, Scarborough.

THE ECOLOGY OF THORNE WASTE.*

E. ADRIAN WOODRUFFE-PEACOCK, F.L.S., F.G.S., ETC.

(*Continued from page 304*).

One of the troubles in burning summers then, as now, I judge, were moorland fires. I have seen parts of the centre bog burning for weeks together in 1874. There was another fire, on September 5th, 1896, when about one thousand acres of moor were in flames, and ten thousand tons of cut and stacked peat drying for fuel were destroyed. Yet, I cannot say that I found any proof whatever that a single rare species had ever been killed off there by fire. The evidence I possess leads me to judge that warping over the old edge turbaries and draining fully have obliterated *Scheuchzeria* and all the other good species Dr. P. Ellis and others told me of ; at least *he gave* that as the sole cause of the change, and he was in a position to know. (1, 2, 4, 7, 13.)

This bog even when drained as fully as possible, without the use of powerful low lifting steam pumps, is so much above the level of the surrounding area when dry, and of the flood tide water of the River Ouse, thanks alone to peat growth, that in order to warp it by flooding from that river, its upper surface for some feet, in its highest portions as much as eleven even, is cut off, dried, and sold as turves or as stable litter. Thus reduced in height, by a system of pit digging, locally called ' honey combing,' and finally filling in of the partition walls, section by section—the deeper these pits are carried down into the peat so much the better for the future warped soil—this bog will in time be all warped and covered fully over with alluvium from the River Ouse, that is, converted into valuable arable land. This sort of cutting down was discovered or suggested when the first portion was warped—the turbaries in and near Crowle, about 1842 approximately. This was the bog's original eastern edge. It was when these turbaries disappeared with all their interesting ecological circumstances, that Thorne Waste became the desolate wilderness botanically it has ever since remained. (1, 2.)

THE TREES UNDER THE PEAT.—To those I have seen I put the personal mark (†).

Alnus rotundifolia,† *Betula tomentosa.*† Still existing.† On the Thorne side, and till 1880, and perhaps till now, by Crowle " New Decoy." By a slip of the pen they are called Beeches by Sir R. Payne-Gallwey. The Beech cannot grow on peat. *Corylus Avellana.*—I have heard of nuts on the east and north sides from the lower peat, but have never seen them. *Pinus sylvestris* † (see below). *Quercus pedunculata.*†

In what quantities I cannot now say. *Taxus baccata*,† found in both quercesques and open pinesques, but rarely. These seem to be all I made notes of, but I am perfectly sure I have heard of other species, but I cannot trust to my memory now after forty-five years. (1, 2, 3 4, 19.)

'I have seen some fir-trees'—*Pinus sylvestris*—says De la Pryme, writing about 1700, 'as they have lain all along, after they were fallen have struck up great branches from their sides which have grown into the thickness and height of considerable trees. I have been told by several gentlemen that about twenty years ago, one Sanderson of Hatfield died, aged 80 years'—(*i.e.* from about A.D. 1620)—'whose father, much about the same age, did frequently assure him, and other gentlemen who were curious in the matter, that he could very well remember many hundreds of great fir trees (*P. sylvestris*) standing one here and another there, in a languishing condition'—from water-chill and toxic-atrophy—'half as high as houses, and some higher, whose tops were all dead'—a sign of toxic-atrophy—'yet their boughs and branches always green and flourishing, growing all of them in these levels' of Hatfield. Also 'an old man at Crowle tells me that he had heard his father say that he could remember multitudes of shrubs and small fir-trees (*Pinus sylvestris*) growing here, while this country was a chase, and while the vert (deer) was preserved before the drainage.' 'In many old charters that I have seen of Roger de Mowbray, Lord of Axholme, who lived in the year A.D. 1100, relating to Hirst, Bellwood, Ross, Sandtoft, etc.'—all in Lincolnshire—'it appears that then all these places were covered with a great old decaying forest of wood.' Dying of toxic-atrophy or self-poisoning from their own excreta, as Sir Sainthill Eardley-Wilmot and I worked out, the one in India and the other here in Lincolnshire. I have proved that the mid-Lincolnshire pine forests struggled on till 1850 or about that date; in south-west Yorkshire in contradistinction to Lincolnshire, they died out 150 years or so earlier. These quotations are from Stonehouse's *Isle of Axholme*, London, 1839, p 62.

This tree list is a short one. No doubt there were others, such as *Pyrus Aucuparia*, but I have no certain proof. Yet here, in Cadney parish, this species has outlasted even the Birch (*B. tomentosa*) which I regard as our earliest and also most lasting bog and bog-edge species.

The Bog Flora. I.—Drier Moor List.

Agrostis canina, † *A. tenuis*, † *Andromeda polifolia*, especially where the moorland had been lately 'fired.' † *Calluna vulgaris*, second predominating species on dry moor. † *Calystegia sepium*, moor-edge, W. by ducks.† *Carex flava*†

Carex fulva, the same. † *Carex glauca*, W. † *Carex hirta*, the same. † *Carex œderi*, E., W., very rare. † *Centaurea nigra*, edges on all sides from warp, muddy boot or mammal carriage. † *Corydalis claviculata*, birch and willow bushes only. *Empetrum nigrum* I have received from both the Lincs. and Yorks. I have never seen it there myself. It is borne the world over by alimentary-canal carriage, by ducks, † gulls, † and skuas. † At our low levels it is a curiously uncertain species like duck-carried *Eriophorum vaginatum*, which in Lincolnshire I have only found in the wettest bogs, duck carried, † too wet for *E. angustifolium*, which normally grows on a lower saturation level. Others knew it, too, as rarely on Thorne Waste. I can only say in my time *Empetrum* was not visible. *Epilobium angustifolium*, wind sown always, as in cities, London, Edinburgh, etc.† *Erica cinerea*, gull and moor-fowl sown, by every means they use. *Festuca ovina*, *F. bromoides*, † *The Naturalist*, 1907, pp. 330-332. *Galium saxatile*, *Leontodon nudicaule*, human carriage. *Luzula multiflora*,† *Melampyrum pratense*.† In the case of these last two species I do not yet fully understand their means of carriage. *Nardus stricta*, † Waders, † and ducks.† *Orchis incarnata*, † *Ophioglossum vulgatum*, † on enclosed moor, mammal-food or foot-carriage. *Potentilla erecta*,† *Pteris aquilina*, the predominate species on the driest moor. It spread greatly within my recollection, overpowering everything but *Betula tomentosa*, even the *Salices*. It is a relict here, as in the high Pennines in Lancashire and Yorkshire, as also in Lincolnshire, of past woodland growth. There are over eleven feet of it on the south by the railway, and W. Tune told me that there is a buried oak woodland there. *Rhinanthus Crista-galli*, † human or mammal carriage. † *Rubus Balfourianus*, *R. plicatus*, I believe this was *R. Balfourianus* only. *Salix aurita*,† *S. Caprea*,† *S. cinerea*,† *Scirpus caespitosus*, † *Symphytum* (*patens*, Sibth?).* S. Human outcast? *Viola flavicornis*, † carried by moorland birds, I know, but by what species I have no proof yet.

II.—Damper Moor List.

These are practically all carried by ducks, gulls and waders. Many more by the last than could be believed without special study.

Drosera anglica, † in quantities. *D. longifolia*, † between the other two in quantities. *D. rotundifolia*, † in vast quantities. Also several hybrids or cross hybrids, I was too young to master. The commonest, I think, was *D.*

* I followed Babington wholly at the time, and in this he was not reliable. I believe it was *S. peregrinum* Ledeb., but I cannot be sure.

rotundifolia × *longifolia*. These were caused by *Diptera* visiting the flowers first of one species and then of another. I have watched them doing so, for before or since I have never seen *Droserae* in such masses. As they died out, they departed in the order they are named here. *D. anglica* first, and I find they ever do so. *Erica tetralix*,† *Eriophorum vaginatum*.† Third predominating species at one time. *Juncus squarrosus*,† waders and ducks,† *Lotus uliginosus*,† *Myrica Gale*,† Moor fowl, grouse, blackgame.† *Narthecium ossifragum*,† *Pedicularis palustris*,† and in turbaries. *Peucedanum palustre*. I never could find the spot, though I heard of it. *Phragmites communis*, † *Sagina nodosa*, † *Salix repens*, † *Valeriana dioica*, † *Viola palustris*, † rare, but what carries it? Gulls certainly,† but what other species?

III.—Spongy Moor.

Mostly duck carried.†

Aira setacea 5, *Carex disticha*,† *C. limosa* 5, *C. paniculata*, † *Eriophorum augustifolium*, † *E. latifolium*. On the east only in the now warped over turbaries; N. and C. along a line of springs over the Keuper-Marl and Keuper-Sandstone junction. In boths spots on accounts of the line from these beds.† *Molinia caerulea*, a species which must have winter flooding.† This had almost gone in 1907, and was only found at the bottom of the deeper 'honeycombing' along with *Eriophorum vaginatum*, but was in acres at one time, and held the fourth place in frequency. At the same date the part of the waste I worked was too dry for *E. angustifolium*. *Osmunda regalis*,† *Rumex Hydrolapatheum*,† ducks.†

(*To be continued*).

——: o :——

Acherontia atropos, etc., at Keighley.—A few days ago I received a Death's Head Moth which had been caught in an engine room at Crosshills, near Keighley, last August. It is over thirty years since a neighbour brought me the only one recorded for this district (Wilsden). It had flown into his house, and squealed when caught. Perhaps the most marked feature this season in entomology in this district has been the great abundance of the Red Admiral butterfly—a species which is not at all common in most years. It is common everywhere. A few minutes ago on going into my garden there were three. It was also common about Grange during the last week in September. Wasps have been a failure here this year, in contrast to their abundance last year. At Grange I found them to be abundant.—E. P. Butterfield.

A specimen of *A. atropos* has been taken at Meltham, Huddersfield, this year.—G.T.P.

A GUIDE TO THE GENERA OF BRITISH AGARICACEAE.

HAROLD WAGER, D.Sc., F.R.S.

(*Continued from page 332*).

TABLE III.—*contd.*

Sub-Order VIII.—AGARICACEAE.

Section IV.

Pileus fibrillose, floccose, pruinose or viscid, margin straight or recurved. Stem fleshy, simple, solid or hollow. Gills free.

Schulzeria Bresad. (Cf. sect. II.). Spores white.

Chlorospora (Gr. *chloros*, green). The only British species is *Schulzeria Eyrei* Mass. Spores pale green.

Pluteus Fr. (*pluteus*, an arched or sloping roof for the protection of soldiers during military operations). Spores pink.

Pluteolus Fr. (diminutive of *Pluteus*). Spores rusty.

(**Bolbitius** Fr. See sub-order III.)

Pilosace Fr. (Gr. *pilos*, felt, *sakos*, a garment). Spores purple-brown.

Section V.

Pileus convex, not umbilicate, fleshy, scaly, silky or downy, viscid or smooth, sometimes fringed at the edge, incurved. Stem, fleshy simple or with an imperfect or rudimentary ring. Gills sinuate, adnate or adnexed.

Tricholoma Fr. (Gr. *thrix*, a hair ; *loma*, a fringe). Spores white.

Entoloma Fr. (Gr. *entos*, within ; *loma*, a fringe). Spores rosy or salmon.

Hebeloma Fr. (Gr. *hebe*, youth ; *loma*, a fringe). Spores dull tan or brown.

Inocybe Fr. (Gr. *is, inos*, a fibre ; *kube*, a head). Spores often angular ; tan or brown in colour.

Hypholoma Fr. (Gr. *huphe*, a web ; *loma*, a fringe). Spores slate-purple.

Section VI.

Pileus infundibuliform to plano-drepressed, or convex becoming depressed, scaly or pruinose, incurved. Stem fleshy, simple. Gills decurrent, rarely adnate.

Clitocybe Fr. (*klitos* a slope ; *kube*, a head). Spores white.

Laccaria Cooke (Ital. *lacca*, varnish). Spores warted, whi e.

Clitopilus Fr. (Gr. *klitos*, a slope ; *pilos*, a cap). Spores pink, sometimes very pale.

Flammula Fr. (*flamma*, a flame). Spores rusty or ochraceous.

Section VII.

Pileus conical, convex or umbilicate, incurved. Veil fugaceous, sometimes at margin of pileus. Stem cartilaginous, hollow or stuffed. Gills adnexed, adnate or free.

Collybia Fr. (Gr. *kollubos*, a small coin). Spores white.

Leptonia Fr. (Gr. *leptos*, delicate, slender). Spores salmon-pink.

Naucoria Fr. (*naucum*, a trifle, *i.e.* veil nearly obsolete). Spores rusty.

Psilocybe Fr. (Gr. *psilos*, naked ; *kube*, a head). Spores brown-purple.

Panaeolus Fr. (Gr. *panaiolos*, glittering, all va egated). Gills variegated with black spots. Spores black.

1920 Nov. 1

Section VIII.

Pileus conical or convex, margin more or less striate, straight or revolute. Stem cartilaginous, hollow or stuffed. Gills free or attached.

Mycena Fr. (Gr. *mukes*, a fungus). Gills adnate or adnexed, often sinuate, often denticulate or fringed at the edge. Spores white.

Nolanea Fr. (*nola*, a little bell ; from Nola in Campania, where bells are said to have been first made). Gills free or adnexed. Spores rose-coloured or pink.

Galera Fr. (*galerus*, a cap). Gills adnate or with decurrent tooth to almost free. Spores yellowish-brown.

Psathyra Fr. (Gr. *psathuros*, friable). Gills more or less attached or free. Spores purple or brownish-purple.

Psathyrella Fr. (Diminutive of *Psathyra*), Gills adnate or free. Spores black or nearly so.

Section IX.

Pileus convex, more or less fleshy, with a *cortine*, a cobweb-like veil, extending from the edge of the pileus to the stem. Stem more or less viscid imperfectly annulate or zoned from the fibrillar *cortine*. Gills usually adnate, sometimes free or sinuate with decurrent tooth.

Cortinarius Fr. (*cortina*, a curtain). Spores rusty or cinnamon. Cf. *Flammula* and *Pholiota*.

(*Cortinarius* is most nearly allied to *Flammula*, but the former grows on the ground, the latter on wood. *Flammula* has decurrent gills.)

Section X.

Pileus usually infundibuliform or umbilicate, or, in some species of *Eccilia* and *Tubaria*, convex or umbonate, incurved. Stem cartilaginous, hollow or stuffed. Gills decurrent or sub-decurrent.

Omphalia Fr. (Gr. *omphalos*, navel). From the depression in the centre of the cap. Spores white.

Eccilia Fr. (Gr. *ekkoilos*, to hollow out). Spores rose-colour or pink.

Tubaria Fr. (*luba*, a trumpet). Spores rusty.

Section XI.

Pileus fleshy. Stem excentric, lateral or absent. Gills usually decurrent, sometimes adnate.

Pleurotus Fr. (Gr. *pleuron*, a side ; *ous*, an ear). Spores white.

Claudopus Fr. (*claudus*, lame, defective ; Gr. *pous*, a foot). Spores pink.

Crepidotus Fr. (Gr. *krepis*, a slipper). Spores pale rusty or cinnamon.

TABLE IV.

In the following table the genera are arranged in accordance with the presence or absence of volva, ring or cortine ; the attachment of the gills ; and, the colour of the spores. This table will be found useful in the field as an aid to the preliminary determination of the genera. The name of a genus in italics indicates that the morphological character opposite which it stands is not normal for the genus but may occur in some species. Genera for which the characters are normal are printed in ordinary type.

TABLE IV.

m central	Spores white	Spores pink	Spores ochraceous	Spores purple	Spores black
and ring : s free	Amanita				
: gills	Amanitopsis	Volvaria	Acetabularia	Chitonia	*Coprinus*
: gills	Lepiota	Annularia		Psalliota	
: gills ched	Armillaria		Pholiota	Stropharia *Hypholoma*	Anellaria *Coprinus*
e : gills ched or rrent			Cortinarius *Flammula*	*Hypholoma*	*Gomphidius*
simple : free	*Collybia* Schulzeria *Hygrophorus* *Russula* *Marasmius*	Pluteus *Nolanea*	Pluteolus Bolbitius *Inocybe* *Cortinarius*	Pilosace	*Psathyrella* *Coprinus*
simple : adnexed dnate	Russula Mycena Collybia *Hygrophorus* Nyctalis *Lactarius* *Clitocybe* Laccaria Marasmius	Nolanea Leptonia *Entoloma* Clitopilus	*Inocybe* *Hebeloma* Naucoria Galera *Bolbitius* *Cortinarius* Flammula	Psilocybe Psathyra Hypholoma	Panaeolus Coprinus Psathyrella
imple : sinuate	Tricholoma *Mycena* *Marasmius*	Entoloma *Nolanea* *Leptonia*	Inocybe Hebeloma *Cortinarius*	*Hypholoma* *Psilocybe*	
imple : rrent	Lactarius Hygrophorus Clitocybe Omphalia Cantharellus Xerotus *Nyctalis* *Marasmius*	Clitopilus Eccilia	Paxillus Tubaria *Flammula* *Cortinarius* *Inocybe*	*Psilocybe*	Gomphidius
xcentric al or t : fungus y	Pleurotus Cantharellus	Clitopilus Claudopus	Crepidotus *Paxillus*		
xcentric al or : fungus , leathery rky	Lentinus Panus Trogia Schizo-phyllum				

PLANT GALLS FROM SWALEDALE.

WM. FALCONER, F.E.S.

AFTER the close of the Union Meeting at Reeth in May, two other profitable days were spent about Grinton and Cogden Gill and at Richmond. It was somewhat early in the year for galls, many of the agents, especially the dipterous ones, not yet having put in an appearance, although the vegetation was still largely fresh and unspoilt, and—as no mature plant structure can be galled—in the most receptive condition, only awaiting their advent. Still, the number of different forms observed at this early season (47 in all) gives every indication that the district will be found very rich in these productions. Some, however, were old galls of last year, and several others, notably amongst those due to mites, were in their initial stages, but quite recognisable.

In reviewing the galls produced through the agency of parasitic fungi noted on this and other occasions, it becomes apparent that they have not been exhaustively studied in this country by any competent mycologist from the standpoint of the gall student. Specific instances may be given in support of this contention. It is *Puccinia tumida* Grev. and not *P. bulbocastani* Fckl. which swells, distorts and discolours certain parts of *Conium denudatum*, Plowright being originally responsible for the error. which has been copied by subsequent writers.* *P. bulbocastani*, which is rare, is on the British list, and the common *P. tumida*, the true agent, is not. The fungus observed independently on the cliffs south of Scarborough by Mr. Brown and myself in September last† as greatly enlarging the stems, leaf petioles and midribs of the salad burnet, was probably *Phragmidium sanguisorbae* Winter. There are doubtless others which have been similarly passed over, and four of them occurred in Swaledale. The grounds on which their claims for admission to the British list are based are given in each case.

LEPIDOPTERON.

Epiblema tetraquetrana Haw. On birch, in the wood near Healaugh.

HYMENOPTERA.

(First seven on oak, last two on willows.)

Andricus pilosus Adlr. f. *fecundator* Cam. In several woods in the district, old galls, numerous.

A. solitarius Fonsc. Last year's galls, many parasitised and closed, in the woods between Downholme Bridge and Marrick Priory.

A. albopunctatus Sch. As the last, and near Cogden Hall, but new galls.

---

* *Vide* Groves' 'British Rust Fungi,' 1913, pp. 186-7, to which my attention was directed by Mr. Mason.

† *The Naturalist*, December, 1919, and February, 1920.

Dryophanta verrucosa Schl. f. *divisa* Htg. Old galls on a leaf beneath a holly tree, near Cogden Hall; floated from oaks on a high bank 75 yards away. (Mr. Mason.)

D. taschenbergi Schl. Plentiful in the woods between Downholme Bridge and Marrick Priory.

Neuroterus vesicator Schl. One gall, as the last.

Cynips kollari Htg. As the last, Theirns Wood and Cogden Gill, but not in plenty.

Cryptocampus medullarius Htg. On *Salix pentandra*: Arkle, Reeth, Grinton, Gunnerside—common. Mr. Wattam also handed in examples.

C. ater Jur. On *S. pentandra*: Arkengarthdale. On *S. caprea*: Theirns Wood—on both plentiful.

Diptera.

Stictodiplosis corylina F. Löw. On hazel, Theirns Wood, plentiful.

Perrisia crataegi Winn. Remains of last year's galls, in the wood between Downholme Bridge and Marrick Priory, on hawthorn.

Oligotrophus betulae Winn. On birch, as last, and Theirns Wood.

Homoptera.

Chermes abietis Kalt. On spruce, wood near Healaugh, plentiful; wood between Downholme Bridge and Marrick Priory.

Phyllaphis fagi Linn. On beech, Billy Banks Wood, Richmond.

Schizoneura ulmi Linn. On elm, Grinton.

Rhopalosiphum ribis Linn. On *Ribes alpinum*, by river side below Grinton Bridge (Mr. Mason). On *R. nigrum*, Richmond.

Aphis padi Linn. On bird cherry, pretty general. On blackthorn, Arkengarthdale.

A. crataegi Bcktn. On hawthorn, in woods between Downholme Bridge and Marrick Priory, Cogden Gill and Richmond, many examples.

Psylla buxi Linn. On box, Reeth.

Psyllopsis fraxini Linn. Ash, initial stage, Billy Banks Wood, Richmond.

Acari.

Eriophyes rudis Can. On birch, wood near Healaugh, numerous enlarged buds.

E. lionotus Nal. On birch, one tree in Cogden Gill.

E. laevis Nal. This and the next two on alder, and in their early stages. *E. laevis* general and the most abundant form, a seasonal difference only probably.

E. nalepai Fckn. Wood between Downholme Bridge and Marrick Priory.

E. brevitarsus Fckn. Grinton and Billy Banks Wood, Richmond.

E. avellanae Nal. On hazel, abundant and general.

E. pyri Pgnst. On mountain ash, as in *E. nalepai*.

E. goniothorax Nal. On hawthorn, abundant, and in many places of a bright red colour: Healaugh, Cogden Gill, and between Downholme Bridge and Marrick Priory; Richmond.

E. padi Nal. On bird cherry, plentiful and widespread.

E. macrochelus Nal. On sycamore, woods near Healaugh and between Downholme Bridge and Marrick Priory.

Phyllocoptes acericola Nal. On sycamore, general and plentiful.

Eriophyes ? sp. On broad leaved limes, Billy Banks Wood, Richmond, an erineum beneath leaves. Along with the agents were some of the small bimaculate mites like the one noted in Wensleydale (*The Naturalist*, Jan., 1920, p. 31). I have since seen the same erineum in N. Wales on both the broad leaved and narrow leaved varieties of the tree.

FUNGI.

Puccinia caricis Schum. On nettle, by roadside just above Grinton Vicarage (Mr. Mason).

Uromyces anemones Pers. On wood anemone, plentiful, Gunnerside Gill, in the wood on the right bank of the stream.

Urocystis violae Sow. On sweet violet, Gunnerside (Mr. Mason), Healaugh.

Puccinia tumida Grev. On earthnut, Reeth and Arkengarthdale (*ante* p. 360).

Synchytrium taraxaci De Bary. On dandelion, close cropped pasture field above Arkle Town.

Cystopus candidus Lév. On *Arabis hirsuta*, Reeth (Mr. Mason).

Exoascus turgidus Sdbk. On birch, Reeth (Mr. Mason).

Uromyces dactylidis Otthem. On bulbous buttercup, river bank below Grinton Bridge (Mr. Mason). Leaf petiole very much swollen and bent.

Puccinia fusca Winter. On wood anemone, close cropped field above Arkle Town, many examples. Leaf stalk lengthened and nearly erect, leaf itself much smaller, discoloured and much less divided.

Uromyces alchemillae Lév. On common lady's mantle, Reeth, Grinton and Richmond. On the same grounds as the last named.

Puccinia violae D.C. On *Viola riviniana*, Healaugh and Gunnerside. Leaf smaller, and stalk a little lengthened. Fungus raises a large (compared with size of leaf) shallow blister, which implies an increase of surface and larger component cells.

———o———

Forficula auricularia L., var forcipata Steph., in Durham and Cumberland.—I have taken single specimens of this macroforcipital form of the male of the common earwig at Middleton-in-Teesdale, on the Durham side of the river, and at Great Corby, near Carlisle. The examples were obtained in each case by sifting recently-cut grass in a hayfield. —GEO. B. WALSH, Scarborough.

Anopheles bifurcatus L. in Yorkshire.—This mosquito is given in the British Museum 'Map showing the known distribution in England and Wales of the Anopheline Mosquitoes,' 1918, W. D. Lang, as occurring in several places in Yorkshire, but with the exception of a ♀ from Scarborough the records are of larvæ (Aysgarth, Filey and two villages near there). Since the publication of the above search has been made fairly regularly on Austwick Moss, but the first capture was only made on October 18th last, when three ♀s and eleven ♂s were taken, this being in the evening about sunset, at the time *Ochlerotatus nemorosus* ♀s were making their presence felt and a considerable number of ♂s were about (nine ♂s and forty-nine ♀s were taken). The following week-end, at Allerthorpe Common, Pocklington, a further search was made for Culicidæ and seven ♀s of this Anopheles species were taken together with one ♀ *Culicella morsitans*, one ♂ *Theobaldia annulata*, 14 ♀ *Och. nemorosus* and two ♂ *Culex pipiens*.—CHRIS. A. CHEETHAM.

Naturalist,

MARINE BIOLOGISTS AT SCARBOROUGH.

A. I. BURNLEY.

THE Yorkshire Marine Biology Committee, under the leadership of Dr. Irving, at its Scarborough meeting, Aug. 28th to 31st, has added a few more names to the Yorkshire records in Marine Zoology.

Nereis diversicolor, apparently a rare worm at Scarborough, was dug out of the Harbour mud, in addition to numerous beautiful specimens of *Phyllodoce maculata*. In the same region four living examples of *Eteone depressa* were found. This worm, first observed at Scarborough in 1911, was sent to Professor McIntosh for identification, and he reported it in 1912 as 'not hitherto found in Britain.'

With the exception of *Petalostoma minutum*, Gephyreans are rarely seen at Scarborough, but on August 28th a fine *Phascolion* was uncovered in lifting up a layer of Grey Limestone; evidently it thrives best in the finest of mud between layers of soft rock.

Of the four days' work among the rocks, perhaps that of Monday, August 30th, at the extremity of Filey Brig, was most instructive. There, under squarish blocks of limestone, marine organisms, individually and in colonies, were seen to the best advantage. Masses of the tunicate, *Polyclinum succineum*, attracted attention by their semi-transparent, gelatinous, and amber appearance. This tunicate is a new record. Extensive stretches of the Crumb-of-bread sponge, *Halichondria panicea*, intermingled with the dependent *Chalina oculata*, the blushing heads of *Tubularia indivisa*, and the whorls of *Bugula turbinata*, made a happy hunting ground for *Archidoris tuberculata* and allied dorids which feed on sponge, and for various nudibranchs and crustaceans.

The rocks are very much pitted, and in many of the pits appear the scarlet-fringed anemone, *Sargartia miniata*, side by side with the projecting scarlet noses of *Saxicavae*, a coincidence which is somewhat striking. The naturalist who attempts to dislodge these sargartian anemones with his fingers generally pays for his rashness, for the rapid and effective barbing of the fingers by these small creatures, on the slightest provocation, usually produces an irritating rash which may take days to subside.

To the list of amphipods is added *Podoceros pulchellus*. *Dendronotus frondosus*, a dorid usually taken only in trawling, was captured in one of the pools in the South Bay. Much search was made for the sea-hare, *Aplysia punctata*, and the bell-shaped organisms, *Lucenaria campanulata* and *Halyclystus*

octoradiatus, which were so abundant in 1913, but without success.

Twenty species of worms, thirteen zoophytes, fourteen crustaceans, two sea-urchins, five star-fishes, seven nudibranchs, seven sponges, seven fishes and numerous living univalves and bivalves were noted during the four days, but their names have appeared in previous lists and need not be repeated.

——: o :——

Mutilla europaea L. in N. E. Yorkshire.—On the afternoon of September 1st I paid a visit to Ravenscar. The morning had been misty, but on arrival at the lower part of the moor above Peak Alum Quarries the sun struggled through, and for a time the atmospheric conditions tempted a few Aculeates to a half-hearted display of energy. A few examples of *Colletes succincta* L. put in an appearance near their burrows at the side of the sandy track, together with a few *Andrenae* and *Bombi*. The latter were carefully watched with the idea of discovering a nest and so taking the ' solitary ant ' in its lodgings, but repeated search proved unavailing. However, just as I was leaving the locality I found a single female *Mutilla* crawling up a cart-rut. A further search of about an hour unfortunately produced no further result. This specimen is considerably smaller than the one I got within a few hundred yards of the same spot in August, 1905, in fact the latter insect was an exceptionally fine example. This makes the fourth North Yorkshire specimen to be recorded in *The Naturalist*, but a record by Professor Meldola from Low Moor, Fylingdales (*Entomologist*, 1913, p. 316) should be remembered, as the specimen is now in the Hope Museum, at Oxford. There are two apparently unrecorded specimens in the Whitby Museum. one with no locality label attached, and the other from Esk Rigg, opposite Keys Beck House, 2nd June, 1918. All the known Yorkshire specimens so far are females. The male is a much rarer insect, and winged, and should be looked for on bramble blossom, etc. Mr. Elgee (' The Moorlands of North Eastern Yorkshire,' pp. 268-272) refers to the possible effect of the Glacial Epoch on this species, and to the European distribution of the genus, and calls attention to a record by Bold in *The Trans. Nat. Hist. Soc. Northumberland and Durham* for 1855 of the occasional capture of the insect on the Sandhills near South Shields. That it still remains in Durham is shown by its occurrence to Mr. J. W. H. Harrison at Black Hall Rocks (*The Vasculum*, 1915, p. 17).—Wm. J. Fordham, M.R.C.S., L.R.C.P., F.E.S.

—: o :—

Mr. T. Lewis gives ' Notes on the Breeding Habits of the Little Tern ' in *British Birds* for September.

YORKSHIRE NATURALISTS AT KIRKHAM ABBEY.

Yorkshire Naturalists foregathered in good numbers to derive enjoyment from the natural beauties of the sheltered vale of Kirkham, on Saturday, July 10th. Unfortunately the flooded state of the Derwent prevented the investigation of all the area. Prior to the rain, a fair amount of work was accomplished, the botanical wealth being vastly enjoyed. The grounds, wherein are the remains of the Augustinian Abbey, provided much of interest to the botanists and conchologists, and many plants of the Great Mullien were observed to be attacked with the larvæ of *Cucullia verbasci*, the writer counting fifty-three specimens. Afterwards the party was taken in charge by Mr. Hayton, head gardener at the Hall. First an inspection was made of the gardens, now in course of reconstruction, and particularly pleasing was the area devoted to old-time herbs, the species best described by the lines addressed 'To a Statue of Flora in a Herb Garden,' written by our member, Mrs. D. U. Ratcliff :—

Little Goddess, flower-fair !
  Guard my herbs from every ill,
Lilies, Lavender and Rue,
  Rosemary and Daffodil,
Gillyflowers, red and white,
  Coriander, Marigold,
Fennel, green and faery-light.

Little Goddess, flower-wise !
  Bergamot attends the gate,
Myrtle, Mallows, Marjoram,
  On thy pretty pleasure wait.
Pimpernel and Love-in-Mist,
  Southernwood and snowy rose.
Shall enwreathe thy snowy wrist,
    Little Goddess, flower-sweet,
    Bless the garden at thy feet.

Afterwards the route was along the pleasant country lane in the direction of Firby, and then came the rain, and though the leafy canopy of the woodland trees for a time enabled investigations to proceed, the shower-baths, when the wind played amongst the branches of the trees, were such that even a naturalist had to quit. At the meeting held in the Hall grounds good reports were presented, and thanks were accorded to Sir Edward A. Brotherton, M.P., for the facilities given to visit his estate, to Mr. Hayton for his services as guide, and to Mr. A. I. Burnley for making the local arrangements. Sir Edward cordially acknowledged the vote.—W.E.L.W.

Vertebrate Zoology.—Mr. S. H. Smith writes :—The section was officially represented by Messrs. H. B. Booth and myself. All the common species of birds were in evidence, and in addition were the following :—Green Woodpecker, Jay, Magpie, Kestrel, Sparrow Hawk, Blackcap and Garden Warbler, Whinchat, Redstart, Bullfinch, Dipper, Kingfisher, Moorhen, and Reed Bunting.

Mr. Booth pointed out that Jays were very numerous, in spite of the efforts of local gamekeepers, and raised the question as to why this should be the case when contrasted with various parts of the West Riding where there were similar conditions as to woodland habitat, and fewer gamekeepers, but no Jays. What is the particular attraction so far as concerns this handsome species in its choice of the Kirkham district, or, in fact, all the York area wherein to make its home? The same remarks might apply in the case of Magpies, of which plenty were seen, and one young Magpie, which had the misfortune to get its plumage so wet that it could not fly, was caught.

A keen look-out was kept for the Lesser Spotted Woodpecker, and Pied Flycatcher, but neither species was observed, though as they have both nested but four miles away it is quite possible they may eventually be found at Kirkham.

The keeper, Mr. Brigham, stated that there were two badger colonies on the estate, both of which were being carefully preserved by order of Sir E. A. Brotherton. Otters still frequent the neighbourhood, and the writer has often noticed traces of their fishing excursions in the shape of remains of fine fish left upon the banks of the Derwent. Other mammals are Stoat, Weasel, Fox, Water Vole, Long Tailed Field Mouse, Bank Vole, Noctule, and Pipistrelle Bats.

We were particularly indebted to Mr. J. W. Hepton, the estate agent, for kindly acting as guide, and take this opportunity of expressing our gratitude for his courtesy. He stated that a pair of Kestrels had a nest and young in the ruins of the Abbey, but the heavy rain prevented our taking photographs.

CONCHOLOGY.—Mr. F. Rhodes writes :—The following species were noted by Mr. G. Fysher and myself, viz. :—

Arion ater.†
A. ater var. *plumbea.*†
A. ater var. *brunneo-pallescens.*
A. subfusca.†
A. hortensis.†
A. circumscriptus.†
Limax arborum.
L. maximus.
Agriolimax agrestis.
A. laevis.
Vitrina pellucida.
Hyalina alliaris.
H. fulva.
H. crystallina.
Pyramidula rotundata.
Helix nemoralis, young specimens.
H. hortensis.
Helicigona arbustorum.
H. arbustorum var. *flavescens.*
Hygromia striolata.
H. hispida.
Ashfordia granulata.
Succinea putris.†
Limnaea pereger.†
L. palustris.†
Physa fontinalis.†
Bithynia tentaculata.†
Spherium corneum.†
Pisidium amnicum.†

A total of twenty-nine species from the Kirkham Abbey side of the river, those marked † were obtained on the Castle Howard side also.

BOTANY.—Mr. A. I. Burnley writes :—On the North Riding side of the river from Castle Howard station to the bridge at Kirkham, the principal plants observed were *Vicia sylvatica, Campanula Trachelium*, and *Verbascum Thapsus*, the last named making a particularly fine display.

On passing into the East Riding, by crossing the bridge at Kirkham, the first plants noted were *Reseda luteola, Parietaria officinalis, Geranium pyrenaicum*, and *Geranium pratense*. The mountain geranium was seen in several places in the lanes leading to Firby Hall. On the garden wall of the Manor House farm *Asplenium Ruta-muraria* grows. In the dry, sandy fields at Firby *Urtica urens* was the commonest weed. In the woods, and along the hedgerows at their lower edge, *Actaea spicata, Campanula latifolia, Campanula glomerata, Lithospermum officinale, Myosotis palustris* var. *strigulosa, Polystichum aculeatum, Polypodium vulgare, Hypericum hirsutum, Hypericum quadrangulum* and *Hypericum perforatum* were found.

No attempt was made to work along the river side, but in passing one noted *Scutallaria galericulata, Barbarea vulgaris, Rosa arvensis, Solanum Dulcamara* and *Glyceria aquatica*—the last-named being abundant, and the York members mentioned that *Butomus umbellatus* occurs at Kirkham.

MYCOLOGY.—Mr. A. E. Peck writes :—The heavy rains of the preceding weeks had produced conditions favourable to the growth of Fungi, but it is yet too early in the year for Mycologists to expect a prolific display. The Section was well represented, but the rain rendered a thorough search of the wooded area well-nigh impossible, and the forty species met with were of the common order.

A Plum tree carried sporophores of the widely spread perennial Polypore named *Fomes igniarius*, one of the fungus pests dealt with by Massee in his ' Diseases of Cultivated Plants and Trees ' (p. 373). Massee recommends that the fruiting bodies of the fungus be removed from the trunks of the trees and burned, and that the parts exposed be treated to an application of gas tar. Fallen trunks similarly affected should be burned, and not left lying about to disseminate their millions of spores.

——: o :——

ANNUAL MEETING OF THE BOTANICAL SECTION OF THE YORKSHIRE NATURALISTS' UNION.

CHRIS. A. CHEETHAM.

This meeting was held on October 2nd, at the Leeds University, by the kind invitation of Prof. Priestley and the University Authorities. There was an excellent attendance of members and associates; Dr. Woodhead presiding, in the unavoidable absence of the President of the Section, Mr. J. Beanland.

The Secretary read a number of letters received in response to enquiries as to the year's fruits and flowers, and an interesting discussion followed, a rough sketch of the proposed annual report was then read and accepted. Sectional officers for 1921 were nominated for election at the General Meeting in December.

Tea was kindly arranged by Mrs. Priestley and Mrs. Pearsall, and a small exhibit was inspected, followed by general conversation. Afterwards Prof. Priestley showed leaves, and spoke further on the subject of leaf colouration in connection with his paper in *The Naturalist* for October. Mr. Pearsall followed with a paper on the Vegetation of Yorkshire lakes, dealing more especially with Gormire; a paper on this subject will probably appear in a later number of *The Naturalist*.

——: o :——

In Memoriam.

JOHN GILBERT BAKER,
D.Sc., F.R.S., F.L.S., M.R.I.A., V.M.H., etc.
(1834—1920).

We very much regret that death removes the name of J. G. Baker from the list of referees on the cover of this journal, where it has appeared without a break since 1889, to our great benefit. Until quite recently his influence over the botanical section of our magazine was considerable, and it was largely to the high standard to which he always aimed that the journal became so essential to students of botany. That his interests were far wider than the study of plants is shown by his well-known ' North Yorkshire: studies of its Botany, Geology, Climate and Physical Geography,' originally published in 1863, and re-issued by the Yorkshire Naturalists' Union in 1906.

Gilbert Baker was born at Guisborough, in Cleveland, in January, 1834; in 1847 he was Curator of the herbarium at the Friends' School, Bootham, York; his first paper to be printed being ' On the Occurrence of *Carex Persoonii* in Yorkshire,' in 1850—seventy years ago !

3 Cumberland road
Kew
Dec. 4 1906

Dear Mr Sheppard

The title of my first paper (Phytologist 1850) was on the occurrence of Carex Persoonii in Yorkshire.
Genera that have been named after me are
Bakeria, Seemann (Araliaceæ) sunk by Bentham & Hooker
Bakeria, André (Bromeliaceæ)
Bakererella, Van Tieghem (Loranthaceæ)
Species that have been named after me are
Rosa Bakeri, Desegliæ
Rubus Bakeri, J. A. Lees
Galium Bakeri, Syme
Asplenium Bakeri, Hook. fil.
Allium Bakeri, Regel
Eucharis Bakeri, N. E. Brown
Crinum Bakeri, Schumann
Iris Bakeriana, Foster
Dracæna Bakeri, Scott-Elliott
Rhodolæna Bakeri, Baillon
and many others

I have kept no list of my scattered minor papers, but 83 on Ferns are enumerated in Christensen's Index Filicum and 42 on various subjects in the Royal Society's catalogue for 1864-1893

Yours very truly
J. G. Baker

Naturalist.

At the York meeting of the British Association in 1906 he revived the acquaintance of many of his Yorkshire friends, and in *The Naturalist* for January, 1907, was a memoir—with portrait—to which reference should be made for further details of his enormous work. A complete list of his papers has not been printed, and its compilation would be an exceedingly difficult matter, as may be judged from the letter written in 1906, in answer to an enquiry—which is reproduced herewith.

The Memoir referred to above was the second of a series dealing with 'Prominent Yorkshire Workers,' H. C. Sorby being the first. It is too much to hope ever to meet with two such men again. It is grand to think that we knew and spoke to them.—T.S.

——: o :——

Milax sowerbyi at Hull.—I am sending a box of specimens of this species, recently taken in a garden on the Beverley High Road, near Haworth Arms, Newland, Hull. In *The Naturalist*, 1878-9, pp. 70-75, I gave a 'List of the Land and Fresh Water Mollusca from Hull and in the Vicinity,' in which this species was recorded with a (?) 'In Gardens, Hull'; and in Petch's 'Published records of the Land and Fresh-Water Mollusca of the East Riding' (*Trans. Hull Sci. and Field Naturalists' Club*, 1904, p. 131), the only record for Holderness which appears, is the one mentioned, namely 'Hull, in Gardens.' The present collection, which shows slight variations in colour, is not from the same part of the town, but the discovery is an interesting confirmation of our only previous record, with which apparently there was some doubt. The species seem to be very common in the present habitat. The specimens have been examined by Mr. J. W. Taylor, who says there is no doubt about their identification. —J. Darker Butterell.

A Peat-boring Demonstration.—On Saturday, October 16th, a large gathering of members and associates of the Yorkshire Naturalists' Union assembled at Moor Allerton to witness an exhibition of geological boring tools, and to test their utility for peat investigation. Prof. Kendall explained his methods and demonstrated how easily the depth of a peat deposit could be ascertained; samples being speedily taken at various depths. In a discussion of the results it was generally agreed that some contamination of samples could not be avoided, and that for the precise determination of organic remains at varying depths it would be desirable to rely on larger samples obtained by digging, which could be carefully trimmed at home. The boring rods were light and easy to handle, and should be of great assistance in mapping the varying thicknesses of a peat deposit, giving samples of a general type of the peat and also of the under soils. Mr.

FIELD NOTES.

W. H. Pearsall made two interesting trial borings quite close together, taking serial samples ; in one case the peat had been cut at some previous date and the excavation refilled by a growth of Sphagnum ; whereas the other boring passed through undisturbed peat, showing it to be mainly due to the smaller cotton grass (*Eriophorum vaginatum*).—CHRIS. A. CHEETHAM.

The Malham Cove Fontinalis.—In the West Riding Flora this aquatic moss is referred to *F. gracilis* Lindb., and the record is ascribed to the late Prof. T. Barker. The inference that the diagnosis was his is somewhat misleading, for in a letter to Mr. H. N. Dixon he mentioned finding the plant, but disclaimed the identification. Opportunity has recently occurred again to submit the moss to Mr. Dixon, and he refers it without hesitation to *F. antipyretica* var. *laxa* Milde., the distinction between these closely related forms resting on small characters of leaf structure and habit. —W. H. BURRELL and CHRIS. A. CHEETHAM.

Forms of Fontinalis in Yorkshire.—In connexion with the Rivers Investigation, gatherings of Fontinalis were submitted to Mr. Dixon. One from the springheads at the foot of Gordale Scar, in slowly moving hard water (11° Clark.), he placed under *F. antipyretica*, approaching var. *gigantea* Sull. ; another, full of fruit in August, 1920, from quickly flowing, very soft water (1-2° Clark.) on the moors above Ravensgill, Pateley Bridge, which superficially resembled *F. squamosa*, he named *F. antipyretica* var. *gracilis* Schp. ; a third, from the backwater at the ' meeting of the waters,' Bolton Woods, he confirmed as *F. antipyretica* var. *cymbifolia* Nicholson.—W. H. BURRELL and CHRIS. A. CHEETHAM.

Anomala aenea De G. (frischi Fab.) and its cyaneous form in Cumberland.—This chafer may usually be found in summer on and near our coast sand hills in varying numbers. Sometimes it is abundant, crawling on the ground among the scanty herbage or, when the sun is warm, flying freely and gregariously. In Cumberland I have never found it away from the coast, but in other counties I believe its distribution is less circumscribed. I have been familiar with the species for twenty-five years, but until June last had never met with the striking, unicolorous dark blue form. On the 27th of that month I was at Allonby, and was gratified to see and capture two fine examples flying in company with dozens of the ordinary British form. I do not know of its previous occurrence in Cumberland, nor indeed in the northern counties of England. This form is the ab. *cyanea* Torre. The ordinary British form is referable to ab. *marginata* Schil. Mr. Newbery informs me that the type form is a brassy insect which apparently has not occurred in Britain.—F. H. DAY, Carlisle.

BIRDS OF THE EASTBY DISTRICT.

Having just returned from a collecting trip which has occupied me all the summer, I take the opportunity of replying to the comments on my Eastby notes in the May and June issues of your journal. In both numbers Mr. Butterfield asks if I am quite sure of a number of my statements. I can assure him that I am, or I should not have made them. While my observations extended only over ten months, thanks to the courtesy of Dr. Arnott of the Eastby Sanatorium, I had every facility for unbroken and continuous bird work during that time. Here and there I have referred to the former status of various birds. Such statements were made on the strength of information supplied by the Rev. Tomlinson, of Bolton Abbey, and Mr. Birch, of Barden, a keen observer of birds, and the best-informed gamekeeper it has ever been my privilege to meet. But, with one or two exceptions, I have refrained from quoting these two reliable authorities, unless, during the time covered by the notes, I have secured corroborative evidence. Thus, when I saw my first Grey Wagtail within the area dealt with, I learned that the first of the year had been seen a day or two earlier at Bolton Abbey. Since Birch promptly gave me the approximate dates of the first arrivals for other years, and also the average dates for departure in the fall, I naturally assumed that the bird was non-resident. Birch has lived on the spot for the whole of his long life, and I know that there is no sounder local evidence to be had on the point. Hence I recorded it. In saying that the Jay was at one time abundant, Birch was referring, I believe, to the time of his father, who preceded him here. As to the Spotted Flycatcher being the most abundant of the summer migrants, it easily outnumbered all others. The Chaffinch, not a migrant, was about the only bird that conspicuously outnumbered the Flycatcher. I did not say that this species ' arrives ' earlier than the Pied species. It did in 1918. Mr. Jasper Atkinson, the Rev. Tomlinson and I saw the first Pied Flycatchers, quite independently, on the same day. I already had notes on the arrival of the first Spotteds. The rest of Mr. Butterfield's letter is corroborative of my own notes and needs no comment. In the same issue Mr. Booth raises some other interesting points. The double broodedness of the Wagtails at Eastby I assumed on the following evidence. In the cases of nests of the Yellow, White and Pied Wagtails that I kept under close observation, I saw the first family fly and the second clutch laid in the same nest. In parts of Bedfordshire as well I have proved the Yellow Wagtail to be double brooded. With the Grey Wagtail my evidence is not so conclusive. The fact that it is at times double brooded is certain, as I have known two broods reared in one nest in Hampshire. Opposite the rectory at Bolton Abbey a pair of Greys reared a brood which flew, I believe, in the middle of May. The birds were known to Mr. Tomlinson, who, early in July, pointed out to me the approximate site of the nest, and said that he believed the birds were sitting again. Later we both had a search for the nest, but apparently too late, for at the foot of the cliff supposed to hold the nest, we saw the old birds *feeding* young which had short tails. These were certainly not the birds that flew in May. It is very unlikely that a fresh pair of birds chose the same site as the first. The assumption that it was a second brood is by far the sounder. In the June issue, Mr. Butterfield resumes his queries. In regard to the record of the Rock Doves seen at the Halton Moor quarry, I am, of course, not prepared to swear that they were not exact domestic replicas of the Rock Dove which had taken to breeding in quarries. Such things have been known. As expressly stated in my notes, however, the birds did *not* stay to breed. As to the breeding of the Yellow Hammer and the Chiff Chaff, which Mr. Butterfield thinks may some day be proved to nest in the area, I can only say that since he has confessed that he has himself never found either of the nests, and that since no one else has, it would be just as well to let it rest at that.—Wm. Rowan, Alberta University, Edmonton, Canada.

NORTHERN NEWS.

Mr. W. J. Lucas writes on British Odonata, 1919, in *The Entomologist* for September.

An exhibition of Gilbert White relics was held in London, in September, organised by the Gilbert White Fellowship.

Belfast Museum Publication No. 74 deals with 'Ancient Irish Gold Ornaments, etc.,' is illustrated, and sold at one penny.

Mr. H. Donisthorpe describes the larva of *Platyrhinus latirostris* F. (previously unknown) in *The Entomologist's Record* for September.

Mr. F. Laing describes two species of *Eupteryx* (Homoptera) new to Britain, in *The Entomologist's Monthly Magazine* for September. In the same journal *Oxyptilus teucrii* Greening, is recorded near Doncaster.

Mr. R. Moir has visited Cromer, and, as might have been expected, 'an important discovery' has been made, viz., 'a flint workshop-site, apparently of Early Chellian Palæolothic Age.' We wonder what will happen when he comes to Yorkshire.

A colony of lesser terns recently established on the Norfolk Coast 'this year was almost completely destroyed by an egg-collector, who swept three-fourths of the eggs, most of them far gone in incubation and some actually chipping, from the beach' (*British Birds*, September).

Volume XX. of the *Transactions of the Leicester Literary and Philosophical Society* contains Mr. G. C. Turner's Presidential Address on 'Our Society and Civic Obligations'; 'Narborough Bogs and Aylestone Meadows,' by A. E. Wade; and Report of the Flora Committee, 1916-19.

A record of *Nonagria arundineta* Schmidt, an addition to the List of Yorkshire Lepidoptera published by the Yorkshire Naturalists' Union, found by a well-known Yorkshire naturalist, appears in *The Entomologist's Monthly Magazine* for October, above the name of Mr. G. T. Porritt.

A small sturgeon, weighing three stones, was caught in Bridlington Bay on September 21st, and purchased by the Mayor of Bridlington for presentation to the King. According to the press it is said to be the first sturgeon caught in the Bay for a hundred years. Clarke and Roebuck, 1881, say, 'Not uncommon off the coast. Near Bridlington it has several times been caught in the stake-nets.'

At the Annual Meeting of the British Mycological Society, Mr. T. Petch delivered his presidential address on 'Fungi Parasitic on Scale Insects.' Other papers were: 'The Genus Ganoderma,' by Carleton Rea; 'The Mycorhiza of Orchids,' by J. Ramsbottom; 'The Audibility of the "Puffing" in the larger Discomyetes,' by Prof. A. H. R. Buller, and 'The Sporulating Gonidia of *Evernia prunastri*,' by R. Paulson.

The Journal of the Derbyshire Archæological and Natural History Society, Vol. XLII., contains a number of antiquarian papers, as well as 'House-Burial, with Examples in Derbyshire,' by Rev. S. O. Addy; 'Fairy Rings: What they Are,' by T. Shakespeare; Ornithological Notes, by N. H. Fitz-Herbert, and 'Lepidoptera at Repton,' by H. C. Hayward. In the paper on Fairy Rings, the author considers that these are not due to fungi, but are sites of British dwellings!

The Cumberland and Westmorland Antiquarian and Archæological Society has issued its Transactions for 1920 (N.S. Vol. XX.). There are several papers, but those dealing with Roman remains are particularly important, viz., 'The Re-discovery of a Small Roman Household Altar'; 'The Provisioning of Roman Forts,' and 'The Roman Road north of Low Borrow Bridge to Brougham Castle, Westmorland.' The Editor, W. G. Collingwood, writes on the Giant's Thumb, a name given to a Saxon Cross.

Naturalist,

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
Nov. 1st, 1920.

DEC. 1920.

No. 767
No. 541 of current Series

THE NATURALIST.

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

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;
AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
G. T. PORRITT, F.L.S., F.E.S.
JOHN W. TAYLOR, M.Sc. **RILEY FORTUNE, F.Z.S.**

Contents :--

LONDON:
A. BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.
Printers and Publishers to the Y.N.U.

Price 9d. net. Prepaid Subscription 8/6 per annum.

YORKSHIRE NATURALISTS' UNION.

RIVERS INVESTIGATION.

A MEETING will be held in Bolton Woods (Valley of Desolation) on Saturday, December 11th. Meet at Bolton Abbey Station at 10-20 a.m. Leader : Prof. Percy F. Kendall.

An examination will be made of the mosses, etc., on grit and limestone rocks in the river, and the grits of the subsidiary stream.

Secretary : CHRIS. A. CHEETHAM,
Old Farnley, Leeds.

BOOKS WANTED.

Alford Nat. Hist. Soc. Reports. Set.
Barrow Nat. Field Club Trans. Vol. VII.
Bath Field Nat. and Arch. Soc. Vols. VIII.-XI.
Birmingham Nat. Hist. and Phil. Soc. Proc. Vol. I., part 2.
Brighton and Sussex Natural History Society Reports, 1870, 1872-3.
Burnley Lit. and Sci. Soc. Parts 8, 13, 14, 16, 17, 18, 20, 21, 23, 24, 25.
Chester Soc. Nat. Science : Ann. Reports, i.-iv.
Cleveland Lit. & Phil. Soc. Trans. Science Section or others.
Croydon Nat. Soc. 6th Report.
Dudley and Midland Geol. etc., Soc. Vols. II.-IV.
Discovery. (Liverpool, 4to). 1891.
Derby Arch. and Nat. Hist. Soc. Part 21.
Devonshire Assoc. Adv. Science. Vols. I., II., III.
Dublin Geol. Soc. Vol. I., pt. 1, 1830? ; Vol. VII., parts 1-3 (or complete Vols.). 1855.
Eastbourne Naturalist (1 part).
Eastbourne Nat. Hist. Soc. Vols. II.-III. (or parts), and part 6 of new series
Frizinghall Naturalist. (Lithographed). Vol. I., and part 1 of Vol. II.
Garner. No. 60.
Geol. and Nat. Hist. Repository, Mackie's. Vols. II., III.
Geol. Assoc. Proc. Vol. I., Part 1.
Geol. Soc., London, Trans. 2nd series, Vol. VI., and Pts. 1-3, Vol. VII (or Vol.).
Geol. Soc. Quarterly Journal. Parts 5 and 7.
Geological Magazine, 1890-1-2-4.
Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).
Illustrated Scientific News. 1902-4. (Set).
Journ. Micrology and Nat. Hist. Mirror. 1914—
Keighley Naturalists' Society Journal. 4to. Part 1.
Kendal Entomological Soc. 3rd Report.
Lancs. and Cheshire Antiq. Soc. Vols. IV., V., VIII., XXVI.
Louth Ant. and Nat. Soc. Reports, 1-12, 19.
Liverpool Marine Biological Com. 1st Report.
Liverpool Geol. Association Proc. Parts 1, 3, 16.
Liverpool Nat. Journ. Parts 1, 3, and 20.
Manchester Geol. Soc. Trans. Vols. XV., XVI., XIX.—XXIII.
Marine Biological Assoc. Journal. Vol. I., Pts. 2 and 3.
Naturalists' Guide (Huddersfield). Parts 1-38.
Naturalists' Record. Set.
Newbury District Field Club Transactions. Vols. III. and on.
North Staffordshire Field Club Reports for 1869, 1871-2, 1876.
Peterborough Natural History Society. Reports 1-8, 11-12, 14-26.
Quarterly Journal of Science. 1878-9, 1882-3, and 1885.
Quekett Club Journ. 1st Series, No. 25.
Royal Cornwall Geological Society Trans. Vol. V. to date.
Salisbury Field Club. Transactions, Vol. II.
Scottish Naturalist. 1881-1891.
Simpson's Guide to Whitby. 1st ed., 1862.
Smith's New Geological Atlas of England and Wales. 1819-21.
Sussex and Hants. Naturalist. 17 parts.

Apply—**Editor, The Museum, Hull.**

NOTES AND COMMENTS.

THE PERIWINKLE.

The Department of Agriculture and Technical Instruction for Ireland, Fisheries Branch, has issued No. 1 of its Reports on the 'Scientific Investigations,' which contains 'Notes on the Breeding Habits and Life History of the Periwinkle' (11 pp. and Plate, 3d.) by Dr. Tattersall. The essay is a valuable one, and we have pleasure in drawing attention to it, as it may be overlooked by English workers. As Dr. Tattersall says, 'It is a commonplace which almost amounts to a scientific axiom, that the most abundant and familiar forms of nature are those which are least known from a morphological, anatomical or embryological point of view. *Littorina littorea* Linn., the common periwinkle, offers a case in point. It is, perhaps, the most abundant and characteristic mollusc of our shores, yet an exhaustive search through the literature of molluscan embryology has revealed the fact that practically nothing is known of its breeding habits and life history. It seems to have been assumed generally that the periwinkle is oviparous; but one writer, at least, Bouchard-Chantereux, according to Jeffreys (British Conchology), Vol. III., p. 372, believed it to be viviparous, and gave an interesting account of its life history. Jeffreys rightly points out that Bouchard-Chantereux was probably dealing with one of the many varieties of *Littorina rudis* and not *Littorina littorea*. The supposed eggs of *Littorina littorea* figured in Bronn's Tierreich, both the first and second editions, are, as Caullery and Pelseneer point out, and as my own observations prove, referable to *L. obtusata*, and not to the periwinkle at all. This figure, the authority for which I have been unable to trace, also appeared in the *Introduction to Conchology*, by Johnstone, and was copied by Step, *Shell Life*, London, 1901, p. 225, and by Newbigin, M., *Life on the Seashore*. These are the only references to the life history of *Littorina littorea* which I have been able to trace in the literature dealing with mollusca.'

EGG-SHELLS.

We take the following from *Bird Notes and News* :—'The formation of a so-called "Museum of Comparative Oology," or "World Museum of Birds' Eggs," in California, should, at least, arouse instant suspicion and precaution on the part of genuine naturalists. The declared purpose is to link together egg-collectors all over the world, and to stimulate the buying, selling, and exchanging of eggs, with the main idea of forming enormous collections of "variety clutches." Wherever colours, markings, size or shape vary in the eggs of any species, the proposition is to get together not fewer than eighty specimens of every kind, adding to these as many nests

and skins as shall appear desirable. Circulars are being freely sent out seeking co-operation among "men and women of the oological persuasion," and citing names which will not allay misgivings excited by the scheme in the minds of British Bird Protectors. The alleged object is, needless to say, "Science," a word that is becoming almost as unpleasant to the ear as "kultur," and covers as dubious morality of action as "liberty" in the days of Madame Roland. It proposes to "enlarge the content of our phylogenetic knowledge of birds," while offering a profitable exchange and mart and promoting "international good feeling and hospitality." The modest claim is even made that the resultant stacks of egg-shells will "afford an insight into the very method of Nature's operations throughout the kingdom of the living," and enlighten mankind "as to the whence and whither of life itself." In short, a new Bible-cum-Origin-of-Species combined, for a new League of Nations under Humpty-Dumpty."

LIBRARIES AND MUSEUMS.

At the request of the members of the Library Association a joint meeting of the members of the Councils of the Museums and Libraries Associations was held in London, on October 21st, with the object of securing more co-operation between the two Associations, and towards this end a Committee was appointed, consisting of equal numbers of each, to meet regularly and confer. From the wording of the recent Act, some of the members of the Library Association had evidently got the impression that the Museums were to come under the wing of the Libraries Committees, whereas, of course, the words of the Act to the effect that the Museums should come 'under the Library Authority,' mean that in future they are to be under the Corporation, such being the Library Authority. In most cases the Museums are already under the Corporation. A suggestion was even made that, in future, the Museums and Library Associations should amalgamate, and hold a joint annual conference. This was naturally strenuously opposed in view of the fact that at present the numbers attending these Conferences are somewhat embarrassing to the hosts, in addition to which each Association already has its week very fully occupied, whereas if papers dealing with both Libraries and Museums had to be crowded into one week, both must necessarily suffer, unless the Conference was extended to a fortnight, which would be impracticable.

LIBRARIANS AND CARETAKERS.

That there is some necessity for joint co-operation between Library and Museum officials is shown by the terms of the form of application for Librarian and *Caretaker* of a Museum,

recently issued by the Oswestry Public Library. From this we learn that the salary is £200 per annum ; *no extras*. For this princely sum *ten* different sets of duties are set out, which include (*a*) To keep the Reading Room open from 9 a.m. to 9 p.m. ; (*b*) To attend to the proper delivery of papers, etc. ; (*c*) To keep order in the Library and Reading Room premises ; (*d*) To keep the Lending and Reference Libraries open for the issue or reading of books ; (*e*) To keep books in order, *and repair them as far as possible* ; (*f*) To collect Fines ; (*g*) All things incidental to the proper use of Books to Borrowers ; (*h*) *To make regular reports* on the working of the Library for submission to the Committee ; (*i*) To act on the instruction of the Committee in arranging Lectures, etc. ; (*j*) To keep the Museum in order, and exercise supervision therein. We then learn that ' The above list of duties *must not be regarded as exhaustive*, but it comprises the main points to which the Librarian's attention will be required.' As ordinary attendants at most Museums, who have practically no responsibility whatever, can command more than the salary offered for Public Librarian and Caretaker at Oswestry, we shall be curious to know the type of individual appointed.

ANIMISTIC FLINTS.

At a meeting of the Prehistoric Society of East Anglia, recently held in London, Mr. Clement Edwards, M.P., exhibited a flint which he had found in a gravel pit in Berkshire on such a date, and at such a depth, while shooting. He took the specimen to the authorities at the Jermyn Street Museum, who referred him to the British Museum, Bloomsbury, and on the strength of his visit there, many of the daily and weekly papers have had photographs of the flint, and photographs of Mr. Clement Edwards, M.P. We were present at the meeting and saw the specimen, but, like *The Museums Journal*, we failed to find any evidence of the flint being the result of the handiwork of prehistoric, or any man. Certainly there were resemblances to faces and to other parts of the human anatomy, but these, in our opinion, had no more to do with the artistic carvings of prehistoric man than have faces in the fire or the shapes of clouds which resemble camels or whales.

NATURAL OR ARTIFICIAL.

Mr. Clement Edwards had been advised by the British Museum Authorities to give every possible detail relating to the find in a paper to the Prehistoric Society, and with this he complied. Mr. Reginald Smith, F.S.A., who followed, told us that the world was divided into two classes of people, those who believed in animistic flints, and those who did not. He told us that Art in prehistoric times developed from the

round to the flat (just in the opposite direction to the development of Art in more modern days), and without actually saying so, he certainly gave his audience the impression that he approved of the artificial origin of the flint, and certainly the press has quoted the British Museum as the authority for stating that the flint had been worked by human hands.

FLINT FACES.

Seeing that this particular nodule must be classed with thousands of others which have been 'discovered,' and has no connection whatever with prehistoric man, it seems a pity that Mr. Clement Edwards, M.P., and the public, should be

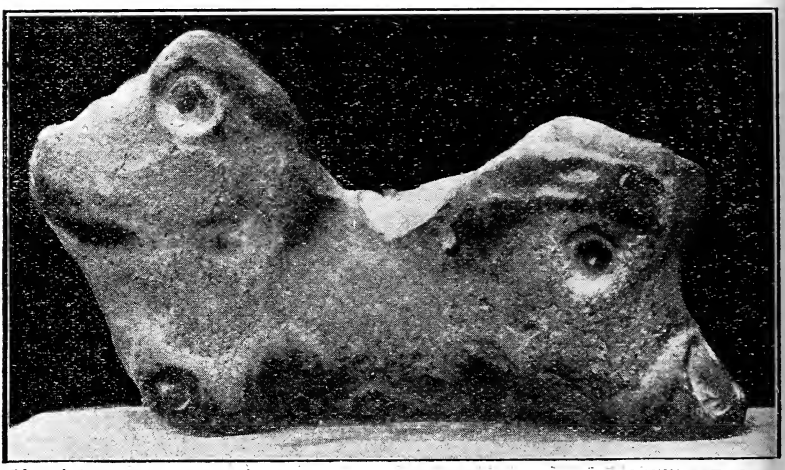


Photo by] [*William E. Gray.*

One view of the Animistic Flint upon which Mr. Clement Edwards, M.P., claims to have seen 83 different carvings.

misdirected in the way they have been. One wonders what the verdict would have been by the British Museum authorities if the nodule had been found by any other than by a Member of Parliament. Mr. Clement Edwards exhibited twenty-four or more different views of this nodule at the meeting referred to, one of which he has kindly sent to us for reproduction in our journal. It seems strange that in view of the fact that among those present at the meeting in London were some of our professedly greatest experts on artifical and natural flint flaking; not one of these cared or offered to give an opinion on the subject, presumably because a Member of Parliament had found the flint, and a member of the British Museum staff had pronounced an opinion upon it.

A MUSEUM GUIDE.

Within a few months of the appearance of an extensive edition, a second edition of the Guide to the Worthing Museum and Art Gallery has been called for, which speaks well for this little publication, the plan of which might with advantage be copied by other of our smaller Museums. The Guide is well illustrated, and one of the blocks showing the evolution of the Bronze Age, from the Palstave to the socketed type, we are permitted to reproduce herewith.

Stages in the evolution of the Bronze Axe.

DOWSING.

Referring to the remarks in these columns, page 343, we observe the following editorial note in a subsequent issue of *Discovery*, and we can only assume that the Editor of that journal is much more innocent than we thought a scientific man could be :—' I have since met this dowser myself, and he did several very interesting experiments for me. He is most sensitive to running water (he is not at all sensitive to stagnant water), then to nickel, gold, silver, and copper in decreasing order. He is sensitive also to certain alloys ; to bronze, for instance, but not to brass. He can tell quite easily whether you have concealed under a hat a sensitive object like a shilling, or something to which he is insensitive

like a piece of brass or a brick. One of his stunts (*sic*) is to say whether or not water is running through the water-pipe at a certain place, and this he can do easily, and apparently infallibly. He can tell whether your safe has any valuables (in metal) in it, and he has succeeded in locating hidden safes by his response to the gold and silver inside of them. He finds, however, that he cannot detect things which are placed above him, and also that the presence of a second sensitive substance at a few feet in a certain direction to another sensitive object inhibits the effect. Apart altogether from the scientific explanation [!] of dowsing, and from its utility in locating underground springs, a demonstration of dowsing makes a first-class parlour entertainment.'

——: o :——

' A Sprig of Acacia ' is the title of an article in *The Transactions of the Lodge of Research*, written by Mr. W. N. Cheesman, J.P.

Science Progress, No. 58, contains, among other articles, papers on ' The Thyroid Gland,' by R. K. S. Lim, and ' The Cycles and Super-Cycles of Nature,' by W. E. Reynolds, and the usual reviews and summaries, etc.

Among the contents of the *Annual Report* and *Proceedings of the Bristol Naturalists' Society* we notice ' Presidential Address, Insects : Their Lore and Legend,' by G. C. Griffiths ; ' The Charophytes,' by C. Sandwith ; ' The Growth of the Dandelion Seedling,' by D. E. Watkins ; ' Bristol Botany in 1918,' by J. W. White ; ' The Carboniferous Limestone of the Clifton-Westbury-King's-Weston Ridge,' by S. H. Reynolds.

The Manchester Microscopical Society has issued its *Annual Report and Transactions* for 1919 (38 pp., 1s. 6d.). Besides particulars of meetings, lectures, exhibits, etc., there is a list of new county records of Hepatics, and Prof. F. E. Weiss's address on ' Fibre-Yielding Plants and their economic importance.' The report also contains reprints of notes on Protozoa, which originally appeared in *The Lancashire and Cheshire Naturalist.*

Besides the reports of Lectures, *The Proceedings of the Bournemouth Natural Science Society*, Vol. XI., contain the following :—' Beetle Colouration,' by J. Neale ; ' Old Maps of Hampshire, Dorset and Wiltshire,' by H. Sumner ; ' Mosquitoes and Malaria in England,' by F. W. Edwards ; ' Surnames,' by Rev. J. E. Kelsall ; ' Hampshire and Kent,' by R. Y. Banks ; ' Old Wardour Castle,' by Rev. J. S. Solly ; and ' Trees on the Horseshoe, Bournemouth,' by H. Backhouse and Rev. C. O. S. Hatton, as well as the Presidental Address of Field Marshall Lord Grenfell of Kilvey, on ' The Art of Ancient Egypt.'

The Transactions of the Eastbourne Natural History, etc., Society, No. 28, records an excursion to Brighton, when nobody but the leader and a friend turned up. Details of the trip are not given. There is an account of the Annual Meeting of the Society in 2020, but we fancy by then the Proceedings of the Society will be on very different lines from those predicted. The writer sees this Society as the foremost in the country, but seeing that the enlightened librarian ' to be ' suggests that the accumulated transactions of the affiliated societies should be burned, it is quite possible that in 2020 nothing of the Eastbourne Society will be known.

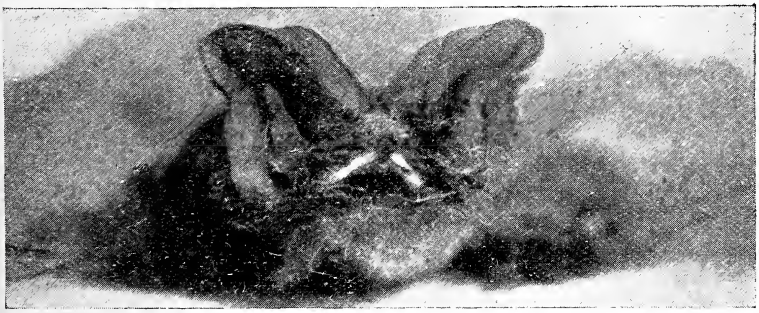
THE BARBASTELLE BAT (BARBASTELLA BARBASTELLUS) AT HELMSLEY: A NEW COUNTY RECORD.

H. B. BOOTH, M.B.O.U.

In *The Field* for October 23rd, 1920, p. 608, Mr. Adam Gordon, head gamekeeper at Duncombe Park, Helmsley, reported

The Barbastelle Bat.

the capture of a female Barbastelle Bat, and asked if there were any other records of this species for Yorkshire. Mr.



Photos by] Head of Barbastelle Bat. [*R. Fortune, F.Z.S.*

Gordon has kindly forwarded the specimen for my inspection. As preserved it measures $10\frac{3}{4}$ inches across the outstretched wings and $3\frac{1}{2}$ inches from the tip of the nose to the end of the tail; the head and body together being rather longer than the tail. The fur on the back was rich brownish-black, almost black, but shading to a lighter brown at the margins. The underside was slightly lighter and shaded to yellowish-brown at the margins; the throat and breast being freely sprinkled with grey. With perhaps the exception of the dark form of the Pipistrelle, the Barbastelle is the darkest coloured of the British Bats, and the uniting of the ears renders it one of the most easy to identify.

Mr. Gordon informs me that this specimen was caught by some boys with their caps as it was flying very low up and down a road near to the ruins of Helmsley Castle at about 10 a.m. (s.t.) during the first week in August. He is of the opinion that there may be a colony of Barbastelles at Helmsley Castle, as a year before, he shot a male of this species there; but it was so much damaged as to be useless for preserving. I have to thank Mr. Fortune for kindly photographing the head of the first named bat.

This makes the ninth species of bat authentically recorded for Yorkshire. The other eight are the Lesser Horse-shoe Bat (now probably extinct in the county), the Long-eared Bat, Noctule, Pipistrelle, Leisler's, Daubenton's, Natterer's and the Whiskered Bats.

Mr. Gordon has met with the Noctule, Pipistrelle, Long-eared and Whiskered Bats in the Helmsley district.

——: o :——

Little Owl attacking Partridge.—During the early part of October, 1919, I found one of this species attacking three Partridges by day in a field near here. In this they are different from the Tawny Owl, which does not interfere with those birds, and here, in Kent, is most useful for destroying rats, etc.—FREDERICK D. WELCH.

Spotted Crake near York.—Mr. Wm. Watson, of the York Museum, informs me that a specimen of this species has been added to the bird collection. It had been killed by telegraph wires near Marston station, on the North Eastern Railway, during the night of October 15-16, 1920, probably when on migration flight.—SYDNEY H. SMITH.

Jays amongst Peas.—Looking out of my bedroom early one morning at the end of June, 1920, I saw five Jays amongst a row of peas, and on going to see what they had been doing, found the pea pods all empty! A few weeks later, in Fawkham village, I saw a dead Jay hung as a scarecrow over some peas, which seemed to show that Jays had tried to interfere elsewhere as they did with mine.—FREDERICK D. WELCH, M.R.C.S., Hartley, Kent.

Scarcity of House Martins in Wilsden, Yorkshire.—House Martins have never been more scarce in this district for over forty years than they have been this year.—E. P. BUTTERFIELD.

On a journey by road from Yorkshire to the South Coast I was pleased to note, in various districts, notably in Huntingdonshire, Surrey, and Sussex, that House Martins were more plentiful than I have seen for many years. On September 26th I saw three pairs feeding their young under the eaves of a farm house near Lewes.—R.F.

THE ECOLOGY OF THORNE WASTE.

Rev. E. A. WOODRUFFE-PEACOCK, F.L.S., F.G.S., F.E.S., etc.

(*Continued from page 356*).

Ditches or Their Sides.

All these species are duck-carried,† much more rarely by snipe and other waders. My notes did not tell me, and at this distance of time, I cannot now remember where all were found ; but generally C. or N. These were fully studied like the ' wells,' on account of my dear old master, the Rev. W. T. Humphrey, suggesting the influence of soils and location, as well as means of carriage to me as a special study in 1874.

Achillea Ptarmica, snipe, † *Alisma Plantago-aquatica*, ducks, † *A. ranunculoides*, † *Alopecurus geniculatus*, † (*A. aequalis*, was I believe, there, too, by the canal side. We have it just by, carried by ducks,† and also in South Lincolnshire†).

Angelica sylvestris,† *Apium graveolens*, both warp edge,† *A. inundatum*, very rare, ducks,† *W. Butomus umbellatus*, this was brought to me, but I never found it growing. It is here in Cadney and was brought to me in 1892, but it was not till 1912 I discovered its very local habitat in a dyke. † *Callitriche stagnalis*, † *Caltha palustris*, generally on warp edge but not always—perhaps the influence of the Keuper Sand Springs, *Carex acutiformis*,† *C. inflata*,† *C. pulicaris*,† *C. riparia*,† *Ceratophyllum demersum*, I have never seen it. *Chara hispida*, † *C. longibracteata* ; the last under warp influence in narrow drains.† *C. vulgaris*, also pools and wells. *Cnicus palustris*.† (*Elisma natans*, I believe this was there, but I could not reach it. It was once, we have specimens, but has since died out through dessication, on the edge of the ' Duck Pond ' on Scotton Common, I believe in Laughton parish ; and Fowler and I have both failed to obtain a floating and submerged leaved plant like it, found rarely, duck-carried, to the carr-ditches of Lincolnshire, Notts and Yorks.† of this area).

Elodea canadensis, impermanent, † *Epilobium hirsutum*, warp or Keuper influence, † *E. palustre*, † *Equisetum fluviatile* warp influence, *typica* was not there. It is very rare in Lincolnshire too. *Galium elongatum*, warp influence, in the narrowest ditches.† *G. palustre*, † *G. Witheringii*, † *Glyceria aquatica* W. N., under warp or Keuper influence. † *Glyceria fluitans* and *Hippuris vulgaris*, both the same, † *Hottonia palustris*,† *Hydrocharis Morsus-Ranae*, duck carried there as all over Lincolnshire, but transitory everywhere, I find. † *Hydrocotyle vulgaris*, pools too. † *Juncus effusus*,† *J. articulatus*,† *J. subverticillatus*,† *J. uliginosus*,† *Lemna gibba*, warp influences. *L. minor*,† *L. trisulca*,†

Lychnis Flos-cuculi,† *Lysimachia Nummularia*,† *L. vulgaris*,† *Lythrum Salicaria*, † *Myosotis palustris*, † *Myriophyllum spicatum*, † *M. verticillatum*, † *Nymphaea lutea*, † *Oenanthe aquatica*,† *O. crocata*. I have never seen it. *O. fistulosa*,† N., *Potamogeton coloratus*,† *P. pectinatus*, N., warp influences,† *Ranunculus trichophyllus*,† *Sagittaria sagittifolia*,† *Samolus Valerandi*,† W., *Scirpus fluitans*, only where there were plenty of ducks, except in certain seasons, when it appeared to be more than usually general.† *S. lacustris*,† *Scrophularia aquatica*, waste edges, its flowers visited by wasps even there.† *Scutellaria galericulata*, edges,† *Sium erectum*,† and *S. latifolium*, both warp influences.† *Sparganium affine*, this is what Humphrey and I made it out to be ; H. C. Watson recorded it for Lincolnshire and it was taken in the Isle of Axholme later, close by. *S. erectum*,† *S. simplex*,† *Spiraea Ulmaria*,† *Stellaria aquatica*,† *Stellaria uliginosa*, also edges of pools.† *Thalictrum flavum*, edges.† *Tolypella glomerata*, pools too.† I know what this species is now, we did not then. *Valeriana sambucifolia* W.† *Zannichellia palustris*, *C.*, never permanent inland in Lincolnshire.

Pools and Wells.

The first were made for duck rests, these so called ' wells ' for duck trapping—in contradistinction to decoying—or shooting. They were constantly growing up on the *Sphagnum* peat, and when used had to be frequently opened out. Many of the species in the last list want to come here too.

Carex curta,† *C. limosa*,† *Castalia alba*, always duck carried. † *Eleocharis palustris*, † *Galium uliginosum*, † *Juncus bulbosus*,† *J. sylvaticus*, † *Lathyrus palustris* border swamps south west angle, 1872. I only heard of it by pools in the C. It cannot survive where there are many hares, and there were plenty on this moor at one time 1874-75. *Menyanthes trifoliata*, † ducks or waders, I am not yet convinced which. *Nephrodium cristatum*. I never saw it that I can remember. *Oenanthe Lachenalii*, near warped edge,† very rare. *Orchis ericetorum*, *Oxycoccus quadripetala*,† *Potamogeton ericetorum*,† *P. polygonifolius*,† *Potentilla palustris*,† *Ranunculus Drouetii*,† *R. floribundus*,† both near warpings, *R. peltatus*, † *Rhamnus Frangula*, † *Rhynchospora alba*, † *Scheuchzeria palustris*, see below. (*Stratiotes aloides*, I heard of it on the E., but never saw it). *Typha latifolia*,† *Utricularia minor*,† *U. vulgaris*.†

Turbaries and the Pools in Them.

These are notes from Dr. P. Ellis, W. Tune, and others. The turbaries were all buried under warp long before I was born. They had many things in common with the pools

of the central waste, and were the *local* seed-supply spots from which seeds were ever being carried, when new ' wells ' or pools were opened or cleaned out in other parts of the bog. They contained the rarest species of this hag, as is ever the case in my experience in England, Ireland and Scotland. It should be remembered, too, that the east edge of this waste was in Lincolnshire, on the limy Keuper marl, and this to a certain extent, what I cannot say, as I never saw these turbaries, influenced their flora by the full supply of lime. This turbary list applies equally to Lincolnshire and Yorkshire, but that is a trifle as the whole area is in the Trent valley. The influence of the Keuper, I now know, but did not appreciate as a lad, was as plain along the line of junction of the marl with the underlying Sandstone in the N. and C. of this bog, as it well could be in a deep bog area, as *Eriophorum latifolium* and other species proved. It must also be pointed out that ducks and waders, for both could take their share in these turbaries, which for the most part were shallow water even in winter, bring long-distance carried seeds from the north to south, or convey them from east to west. The south to north and west to east migration is in the spring and practically leaves us no seed whatever, I find. The seed carrying months are September to early February. Of course, there was the local movement of fowl during the early winter months especially, which may carry the seed in any direction, as *Scheuchzeria* from these turbaries to the pools on the S. waste—it is not of that carriage I am speaking here, but of the more important one from the outside, say for instance, from north Europe or Scotland. As regards local movements of the fowl, three natural-history divisions of north-west Lincolnshire are close by, all rich in our shallow sand bog flora. All I can say of this list as an ecologist is :—The Keuper marl near Crowle was not productive of hares and rabbits ! I should judge, too, that these turbaries were of very ancient date like those of Haxey close by, though when warped over they had long ceased to be used.

Anagallis tenella, Betula tomentosa, Calamagrostis lanceolata, Cladium Mariscus, Cnicus pratensis, Corydalis claviculata, on birch bushes. Not found in north-west Lincolnshire, though still in the county.† Seeded locally from west to east from the other side of the Waste perhaps. I have no information about its carriage in my notes. *Epipactis palustris,* snipe sown I know, it loves limy-peaty spots. *Eupatorium cannabinum* ; has this to do with a limy soil? I think so,† *Habenaria bifolia,* my evidence suggests rabbits destroy this species as much as *Pyrola minor* where they abound. *Hypericum elodes, H. quadrangulum, Lastrea Thelypteris, Lathyrus palustris.* This is not found in north-west

Lincolnshire, we have too many rabbits, which love it, but it is still found in the county. *Lychnis Flos-cuculi, Lycopus europaeus, Mentha aquatica, Menyanthes trifoliata, Myosotis palustris, Oenanthe,* two but not named. I judge *O. fistulosa* and *O. Lachenalii, Oxycoccus quadripetula,* this is another species which suffers from rabbits. † *Parnassia palustris, Peucedanum palustre, Potentilla palustris, Ranunculus Flammula, R. lingua, Rumex palustris, Scheuchzeria palustris,* see below. *Schoenus nigricans, Stellaria glauca, Triglochin palustre,* snipe carried. † *Ultricularia minor* and another *Utricularia* which I judged to be *vulgaris,* not *intermedia,* as this has not been recorded for Lincolnshire. *Veronica anagallis-aquatica, Viola palustris,* with ' a number of carices, grasses and juncuses,' I could make nothing of in 1876.

The last and only specimen of *Scheuchzeria palustris* then found (1870), Dr. F. A. Lees tells me, was taken by the Spectacles Well on the south side of the moor, north of Midge Hall railway station. This well is now destroyed, and there can be little doubt this plant came from a duck carried seed to that spot. It is far nearer the eastern turbaries of the moor by Crowle than to the Rev. M. J. Berkeley's Nottinghamshire locality, wherever it was, for I have no exact note of it. Before human influences were so predominant as they became after 1800, on account of the warping, *Scheuchzeria* was, no doubt, scattered in fitting places all over the suitable bog area of the three counties which meet a little south of Crowle. It has been recorded for two of them, and the third differs in no essential characteristic. I cannot, however, be morally certain of this till I know for good whether *Scheuchzeria* likes a trace of lime in the waters it frequents, *i.e.*, whether it belongs to the *Selinum carnifolia* and *Eriophorum latifolium* bog, or to the pure acid peat flora of our shallow sand-dune swamps like those of north-west Lincolnshire. (7.)

(To be continued).

——: o :——

The Botanical Society and Exchange Club has issued its Report for 1919, Vol. V., part 5, an unusually massive publication, containing an enormous number of notes and records relating to the British Flora, in addition to which there are the following :—' *Glechoma hederacea* L. and its Sub-Divisions,' by W. B. Turrill ; ' Hagström's Critical Researches on the Potamogetons,' by W. H. Pearsall ; ' *Potamogeton Drucei* Fryer in Fryer's Correspondence ; ' Adventive Plants at Bradford,' by J. Cryer ; ' Adventive Plants of the Glasgow Area,' by R. Grierson ; ' Plants of Harbury Cutting, Warwickshire,' by E. Marsden-Jones ; ' Edward Morgan's *Hortus Siccus,*' by the Editor ; ' *Geranium purpureum* Vill. and *G. robertianum* L.,' by A. H. Evans ; ' Plant Extinctions since 1597 and the Dubious Plants of Britain,' by the Secretary. Part VI. of the same publication contains the report of the Distributor for 1919.

THE SPIDERS OF YORKSHIRE.

WM. FALCONER, F.E.S.
Slaithwaite, Huddersfield.

(Continued from page 298).

Gen. *Bolyphantes* Menge, 2-4.

B. alticeps Sund.

This and the next species, both of northern origin, frequent grass, heather and other low vegetation; *B. alticeps* is, however, more local, and occurs in Britain as far south as the Peak of Derbyshire, and is absent from Ireland; abroad it recurs on the Alps of Switzerland and Central Europe, and has been found in Siberia; usually plentiful where met with. *Adult* September and October. First occurrence—the author, Drop Clough, December, 1898.

V.C. 61.—Weedley Springs, E.A.P.; Skidby, Swine Woods, beech wood at South Cave, Riplingham, T.S.

V.C. 62.—Wilton Wood, J.W.H.; Oliver's Mount, R.A.T.; Ayton Village and Aireyholme Wood, Y.N.U.; Eston; Marske; Saltburn, but uncommon.

V.C. 63, 64.—Widely diffused and recorded stations numerous.

B. luteolus Bl.

More general in its distribution and plentiful in Scotland and the North of England, rare in the south and in Ireland; Isle of Man, 1908; common in North Europe but a mountain species in France and Hungary. *Adult* autumn. First record—R. H. Meade, Yorkshire, S.G.B.I., sub *B. alticeps* Sund.; Bradford, V.C.H.

V.C. 61.—Brough, Bielsbeck, T.S.; Skidby chalk pits, E.A.P.; Rillington; Bridlington.

V.C. 62, 63, 64.—Generally distributed and stations numerous.

Gen. *Tapinopa* Westr., 1-1.

T. longidens Wid.

Widely distributed in the British Isles and on the Continent; beneath stones, or on low vegetation, in furze débris, etc; Isle of Man, 1908. *Adult* in autumn. First record—R. H. Meade, Bradford, 1851, S.G.B.I.

V.C. 61.—Bielsbeck, ♀s, beech wood at South Cave, one ♂, one ♀, Snake Hall Moor, ♀, Houghton Woods, ♀, Spurn, ♀, T.S.; Skipwith Common, T.S., W.P.W.

V.C. 62.—Eston Moor, Normanby Intake plantation, Great Ayton Moor, not uncommon, J.W.H.; Marske; Tees mouth.

V.C. 63.—Bradford, R.H.M.; Harden, Calverley, W.P.W.; Coxley Valley; Windsor Castle, Bottoms Wood, Lane, Merridale, Ainley Place, and Pole Moor in the Slaithwaite district; Drop Clough and Wessenden Valley (Marsden); Chew Valley (Greenfield); Crosland Moor and Butternab Wood (Huddersfield), but in none in any quantity.

V.C. 64.—Ingleton, F.B.; Rumbold's Moor, W.P.W.; Knaresborough; Adel moor; Alwoodley plantation; Stubbing Moor.

Fam. ARGIOPIDÆ, 21-44.

Sub-fam. TETRAGNATHINÆ, 9-13.

Gen. *Pachygnatha* Sund., 3-3.

P. degeerii Sund.

Very common and very widely dispersed both in the British Isles and on the Continent; beneath stones and at the roots of herbage. *Adult* throughout the year. First occurrence—the author, Drop Clough, June, 1897.

V.C. 61, 62, 63, 64.—Generally distributed and recorded stations numerous.

V.C. 65.—Sedbergh, T. Sheppard ; How Gill, W.P.W. ; Semmerdale ; Aysgarth.

P. listeri Sund.

Not common, but recorded for Dorset, N. Wales, Cheshire, Staffs., Lincolnshire, Durham, Cumberland, Northumberland, near Edinburgh, and Ireland : continental range extensive ; amongst fallen leaves in woods and herbage. *Adult* autumn to spring. First record—Yorkshire, S.G.B.I. ; Bradford, R.H.M. (V.C.H.).

V.C. 61.—Birkhill Wood (Cottingham), 1 ♀, T.S.

V.C. 63.—Bradford, R.H.M. ; Hurst Wood and Lower Dungeon Wood, Shipley, W.P.W. ; Woodsome, near Huddersfield, both sexes, several ; Hey Wood (Honley), few ♀s ; Wilshaw Reservoir, 1 ♀; Lepton Gt. Wood, 1 ♂, 1 ♀; Deffer Wood (Cawthorn), 1 ♂.

V.C. 64.—Elam Wood (Keighley), W.P.W. ; Ledsham, 1 ♂, S.M. ; Dalton Lane, near Leeds, 1 ♂, 2 ♀s, Sept., 1906.

P. clerckii Sund.

Common and widely distributed in the British Isles and on the Continent, occurring also in Siberia ; generally found in damp places, or in the neighbourhood of water. *Adult* throughout the year. First record—R. H. Meade, Bradford, V.C.H.

V.C. 61, 62, 63, 64.—Widely diffused and recorded stations numerous.

Gen. *Tetragnatha* Latr., 2-5.

T. extensa Linn.

Widely distributed in the British Isles ; abroad, Europe, Asia and N. America ; amongst grass and sedges or on bushes, generally near water. *Adult* May to September. First record—R. Gilchrist, Harwood Dale, *The Naturalist*, June, 1906.

V.C. 61.—Weedley Springs, Sutton, Preston Lane, Keyingham Drain, Kelleythorpe, Meaux, T.S. ; Cherry Cob Sands, E.A.P. ; Kelsey Hill (both sexes), E.A.P., T.S. ; Hutton Cranswick, H.C.D. ; Riccall and Skipwith Commons, W.P.W., W.F. ; Scampston and Rillington, both sexes.

V.C. 62.—Harwood Dale, 1 ♀, R.G.

V.C. 63.—Martin Beck Wood, Doncaster, C. ; Askern, both sexes ; Wothersome.

T. solandrii Scop.

Widely distributed in the British Isles and on the Continent ; beaten from herbage, hedges, bushes and branches of trees ; in many places abundant. *Adult* in summer. First occurrence—the author, Woodhall, June, 1903.

V.C. 61.—Hornsea Mere, very common, T.S. ; Kelsey Hill, E.A.P. ; Skipwith Common.

V.C. 62.—Marton Gill, J.W.H. ; Forge Valley, T.S. ; Kilton Woods.

V.C. 63.—Maltby ; Mag Wood, Armitage Bridge.

V.C. 64.—Ilkley, W.R.B. ; Y.N.U., Bishop Wood ; Wharfedale, from Harewood to Boston Spa and Thorporch ; Chandler's Whin and Askham bog ; Adel moor ; Knaresborough district ; Mickley and Hackfall.

V.C. 65.—Tanfield, W.P.W., W.F. ; Aysgarth.

Gen. *Meta* C. L. Koch., 3-3.

M. segmentata Clerck.

Abundant in all sorts of situations in the British Isles, North Africa and Europe. *Adult* throughout the year, the spring

examples being *M. mengii* Bl. First occurrence—the author, Slaithwaite, May, 1897.

V.C. 61, 62, 63, 64.—Widely diffused and recorded stations very numerous.

V.C. 65.—Y.N.U., Upper Teesdale ; Deepdale, near Barnard Castle, W.E.L.W. ; Mill Gill Force.

M. merianae Scop.

Also common and widely distributed, both at home and abroad ; amongst damp grass, under moist over-hanging banks and on rocks ; sometimes in cellars and outhouses. *Adult* throughout the year. First occurrence—the author, Slaithwaite, May, 1897.

V.C. 61, 62, 63, 64.—Widely diffused and recorded stations numerous. It has been found as a cave-dweller in Long Churn Pot, C.H., T.St., and Scosca Cove, Arncliffe, R.B. The var. *celata* Bl. with a long white abdominal band has occurred at Bottoms Wood and Ainley Place (Slaithwaite), Drop Clough (Marsden), Morton Wood (Holmfirth) and Hey Wood (Honley), V.C. 63 ; Bolton Woods, V.C. 64 ; and Kilton Woods, V.C. 62.

V.C. 65.—Y.N.U., Upper Teesdale ; Mill Gill ; and Whitfield Force.

M. menardi Latr.

Widely distributed in Ireland and on the Continent, N. America and Madagascar ; in Gt. Britain noted for Northumberland, Durham, Lancashire, Staffs., Aberdeen, Ben Aan, Isle of Man and N. Wales ; in cellars, caves and ruins. First record—F. Airey, The Otters' Cave, Sept., 1909, *The Lancashire Naturalist*, p. 224; egg cocoons in Cat's Hole Cave, Nidderdale, and spiders, James Carter, Editor of *The Field*, July, 1874.

V.C. 62.—Lonsdale, 1 ♂ ; near Ayton Station, 1 ♀, J.W.H. ('not a typical example,' J. E. Hull).

V.C. 64.—Otters' Cave, Ribble, near Gisburn, several examples, F. Airey ; Kelcove and Little Kelcove Caves ; Giggleswick, both sexes ; cave in Kingsdale, and an old lead mine near Grassington, C.H. ; Ned Hole, Eavestone Lake, S.M., W.F.

Gen. *Nesticus* Thor.

N. cellulanus Clerck.

Widely distributed in the British Isles and on the Continent ; in dark damp places, drains and sewers, under stones, amongst vegetation and under over-hanging banks ; in the cellars of houses. The female closely guards her egg-sac and, when violently shaken with it from her hiding place, endeavours to carry it off attached to her spinners, like the wolf spider, but in a very clumsy manner with uptilted abdomen. *Adult* summer and autumn. First occurrence—the author, Slaithwaite, May, 1898.

V.C. 62.—Nunthorpe, not common, J.W.H. ; Levisham ; Goathland ; Kilton Wood ; Riftswood (Saltburn).

V.C. 63.—Bradford, G.H.O. (V.C.H.) ; Calverley, S.M. ; Marley, Harden, Shipley, W.P.W. ; Crimsworth Dene, W.P.W., W.F. ; Hardcastle Crags ; Mirfield ; many localities about Huddersfield, Slaithwaite, Dean Head, Marsden, Meltham, Honley, Greenfield, Armitage Bridge, Almondbury, Holmfirth, Dunford Bridge.

V.C. 64.—Shipley Glen, Bolton Woods, Morton, W.P.W. ; Long Churn Cave near Alum Pot, C.H. ; Risplith and Sawley district, S.M., W.F. ; Burley in Wharfedale ; Y.N.U., Harewood Park ; Hackfall ; Bolton Woods ; Kingsdale Beck (Ingleton).

Sub-fam. ARGIOPINÆ, 12-31.
Gen. *Zilla* C. L. Koch, 2-3.

Z. x-notata Clerck.

Common and widely distributed in the British Isles and on the Continent, occurring also in N. America ; in the angles of buildings, walls and windows, palings, bridges, etc. ; occasionally on bushes. *Adult* late summer and autumn. First record—R.H.M. *Zoologist*, 1860, pp. 7146-7151, sub *Epeira similis*, but not definitely recorded, Bradford.

V.C. 61, 62, 63, 64.—Very widely diffused and recorded stations very numerous. I have only met with it once on vegetation, V.C. 63. Fenay Bridge, near Huddersfield, adults on holly.

V.C. 65.—Y.N.U., Upper Teesdale ; Wensleydale.

Z. atrica C.L.K.

Also abundant and widely diffused at home and abroad, but usually occurring on bushes ; noted, however, on walls on the fells far away from foliage of any kind, in Cumberland, F. O. P. Cambridge, *The Naturalist*, Jan., 1895, and on the cliffs on the N. Dublin coast, Dr. Carpenter, ' List of the Spiders of Ireland,' p. 192 (1898). Season as in the last. First occurrence—the author, Bury Mill, Oct., 1897.

V.C. 62.—Very common and recorded stations very numerous.

V.C. 63, 64.—Well represented in the eastern and lower districts, but uncommon in the western and higher parts, the following being the only records to hand for the latter :—V.C. 63, Bury Mill (Scammonden) ; old lane near Lepton Great Wood (Huddersfield), between the top stones of a wall, both sexes. V.C. 64, Austwick, C. Waterfall.

Gen. *Cyclosa* Menge., 1-1.

C. conica Pallas.

Noted for a few localities in Scotland as far north as Rothiemurchus and Inverness, but uncommon in the N. of England and in Ireland ; plentiful in the south of England and with a wide Continental range ; also in N. America ; beaten from bushes and the lower branches of trees. *Adult* May and June. First record—Lister, Yorkshire, S.G.B.I.

V.C. 61.—Hessle Wood, 1 ♂, E.A.P. ; Riccall Common, 1 ♂ from tree near the guide post.

V.C. 63.—Bradford, R.H.M.

Gen. *Cercidia* Thor., 1-1.

C. prominens Westr.

Not uncommon in the south of England, absent from the Irish list, and only one other northern record—an adult pair taken forty years ago in Berwickshire. First occurrence—the author, Adel moor, Nov., 1906.

V.C. 61.—Houghton Woods, 1 ♂, July, 1915, T.S. ; Skipwith Common, 1 ♀, from bracken débris.

V.C. 64.—Adel moor, 1 ♀, from heather overhanging a ditch on the opposite side of the stream to the Reformatory.

(To be continued).

——: o :——

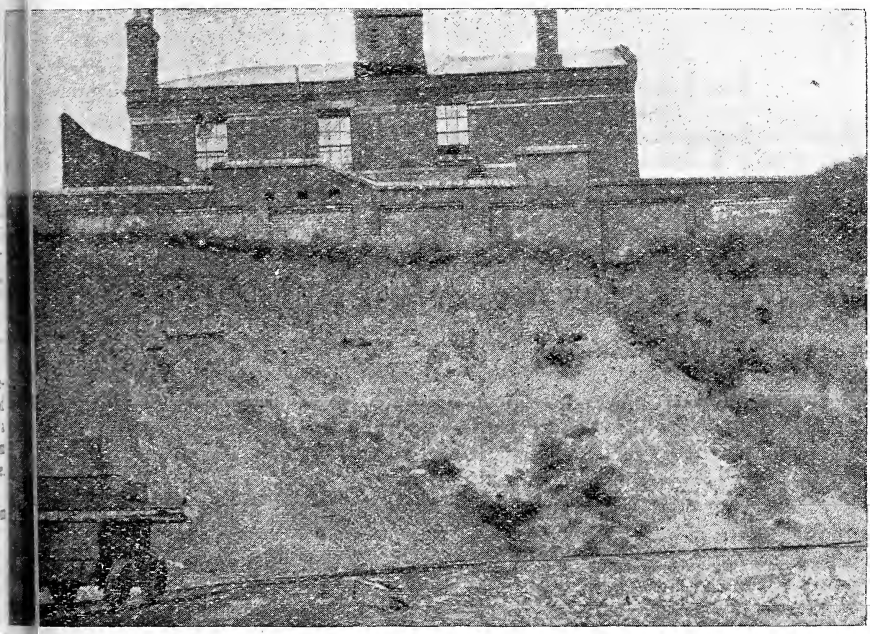
The Hooded or Bladder-nosed Seal is described by Dr. R. F. Scharff in *The Irish Naturalist* for October.

The Scottish Naturalist for September contains a paper by Dr. W. Eagle Clarke on ' The attempted breeding of the Bee-eater in Midlothian,' and R. Dunlop records *Helix cantiana* in Scotland for the first time.

YORKSHIRE NATURALISTS AT BEVERLEY.

THE August Bank Holiday meeting of the Yorkshire Naturalists' Union at Beverley was attended by members from twelve societies, and being favoured by good weather spent a profitable week-end in the neighbourhood of the minster town, where they found comfortable headquarters at the Beverley Arms. The geologists found much of interest in the sections exposed in Goodmanham Valley and in the quarries south of Beverley, the other members devoting their attention to Figham Common, Swinemoor, Pulfin Bog, Westwood, Bygott Wood and Dalton Holme. Pulfin Bog, a relic of primitive fenland, proved of exceptional interest. Mr. E. Cecil Bainton accompanied the members to the bog, and gave them the benefit of his local knowledge.

Mr. F. Boyes and Mr. Picker added much to the enjoyment of the



Upper and Middle Boulder Clays (junction at *), resting on Chalk, at Beverley.

meeting by their welcome assistance throughout the visit, and Mr. F. Runton proved a valuable guide to the geologists in their examination of the quarries.

At a meeting held on Monday, at the Beverley Arms, at which Mr. T. Sheppard presided, reports of the sections were given and sincere thanks accorded to Messrs. D. F. Burton, E. Cecil Bainton, F. Runton, the Queensgate Whiting Co., and Mr. C. Judge of the Victoria Quarries, for permission to visit their estates, to Messrs Boyes and Picker, and also to Mr. J. W. Stather for the excellent arrangements made for the convenience of the members.—T.W.W.

Mr. T. Sheppard writes :—On Saturday the geologists were led by Mr. J. W. Stather, and commenced their work at Market Weighton, walking along the Goodmanham Valley to the sections at the Rifle Butts, on the

line-side going towards Kiplingcotes. As a result of a recent landslip in the target pit, the members had an opportunity of examining, *in situ*, a section in the Lower Lias, which yielded characteristic fossils, and resting directly upon this were the beds of the Red Chalk with *Belemnites minimus*, etc.; thus for the first time for very many years this well known unconformity was visible, the beds of the Middle and Upper Lias, and the whole of the Oolitic series being absent at this point.

A pleasant jaunt along typical wold country brought the members to a large section made for ballast at the line side, one mile west of Kiplingcotes station. Here flinty chalk was surmounted by chalk wash, and in the former the flint nodules had frequently remains of broken *Inocerami* and other fossils embedded in their surfaces. While awaiting the return journey at Kiplingcotes the members had an opportunity of examining a new section in the chalk on the line side immediately east of the station, which yielded typical fossils.

On Monday the writer took charge of the party, which visited the series of extraordinarily deep chalk quarries situated on the high ground on the Hessle Road at Beverley. The first pit examined was that owned by Messrs. Storry, Witty & Co., and the members were here met by the managing director, Mr. F. Runton. Surmounting the chalk at this pit, which adjoins the Barracks, is a remarkably clear section of boulder clay, varying from 15 to 18 feet in thickness.

The different textures of the Hessle Clay (6 feet) at the top, and the Purple Clay (12 feet) beneath, were most noticeable. An examination of the boulders also showed that the upper beds had the usual abundance of pebbles of Grauwacke and Cheviot Porphyrite, while the Purple Clay contained its well striated boulders of Carboniferous Limestone, masses of Basalt, and pieces of Rhomb Porphyry, Pink and Black Flint, Lias, etc. The members next visited the Queensgate Pits, where the zone of *Marsupites* was identified, and the type fossils obtained at a depth of 20 feet from the surface. Specimens of *Belemnites granulatus* were also obtained in this pit. Two or three other pits in the district were inspected, those adjoining the waterworks being covered by Glacial beds, but these were not quite so thick as in Messrs. Storry, Witty's pit. The foreman at the Victoria Pit also enabled the visitors to see the various processes in the manufacture of Whiting.

Birds.—Mr. E. W. Wade writes:—Twenty-seven species of birds were observed, of which the following had young still in the nest:—Redbreast, Garden Warbler, Swallow and Reed Bunting; whilst the following were still in song: Willow Wren, Reed Warbler, Sedge Warbler, Common Bunting, Yellow Bunting and Goldfinch. The Whinchat, now a scarce bird in the neighbourhood, was seen, and the Meadow Pipit, once very common, but almost driven from the district by wet seasons. The Swallows, House and Sand Martins were congregated on the telegraph wires ready for the migration southwards, and two late Swifts were hawking about near the River Hull. Of the waders, only the Lapwing and Snipe were seen at Pulfin Bog, and most of the birds had completed their family duties for the season, and were either silent or had scattered to other quarters.

Diptera.—Mr. Chris. A. Cheetham writes:—Lack of hot sunshine kept the more interesting diptera from the list, but six species (*) are here added to the Yorkshire records.

Ephelia marmorata, Mg. was noted dancing in groups of 6–12 individuals about 9-30 p.m. over a small stream.

One specimen of *Syrphus balteatus* Deg. was almost melanoid, lacking practically all the yellow markings from the abdomen.

As diptera notes from the East Riding are very scanty a full list is given, it shows the possibilities of the district, and given good weather Pulfin Bog would well repay attention.

Culex pipiens L.
Ptychoptera contaminata L.
**Erioptera fuscipennis* Mg.
**E. trivialis*, Mg.
Ephelia marmorata Mg.
Limnophila ferruginea Mg.
**L. discicollis* Mg.
Pachyrrhina imperialis Mg.
P. histrio F.
Tipula scripta Mg.
T. lateralis Mg.
T. lutescens F.
T. paludosa Mg.
Rhyphus punctatus F.
Leptis nigriventris Lw.
L. lineola F.
Hybos culiciformis Fab.
Empis livida L.
Dolichopus trivialis Hal.
Lonchoptera lutea Pz.
Pipunculus campestris Ltr.
Liogaster metallina F.
**Chrysogaster chalybeata* Mg.
Platychirus manicatus Mg.
Platychirus peltatus Mg.
P. clypeatus Mg.
Pyrophæna granditarsa Forst.
Melanostoma mellinum L.
M. scalare F.
Syrphus torvus O.-S.
S. ribesii L.
S. luniger Mg.
S. balteatus Deg.
S. lasiophthalmus Ztt.
Sphærophoria menthastri L.
Ascia podagrica F.
A. dispar Mg.
Rhingia campestris Mg.
Eristalis tenax L.
E. intricarius L.
E. arbustorum L.
Helophilus pendulus L.
Syritta pipiens L.
Oliveria lateralis F.
Musca corvina F.
Cordylura ciliata Mg.
Tetanocera elata F.
T. lævifrons Lw.
T. robusta Lw.
T. coryleti Scop.
**Opomyza florum* F.
Sepsis cynipsea L.
Notiphila riparia Mg.
**Meromyza læta* Mg.

Flowering Plants.—Miss Dorothy M. Browning writes :—Contrasting greatly with Swaledale, the Beverley district does not afford much change in the flora, due to variations in altitude. Low land, overflowed in many places wholly or partially with water, and producing sedge, coarse grasses and other aquatic plants, is the dominant impression. Although the land is being reclaimed from its former more swampy condition, nevertheless it is still liable to floods in the wet season.

The natural drainage of 'Lincolnshire North of the Humber,' as the Holderness district might possibly be termed,* is almost exclusively the work of the River Hull and its tributaries. Originating on the edge of the Wolds, west of Driffield, it is joined by streams, amongst them the small Beverley Beck which runs through some of the best botanical ground, mostly patches of marsh and bog, and land in the next stage to this, broken up by innumerable water channels. Although the latter are of artificial construction, the aquatic colony populating them shows no indications of man's interference. In these drains and channels grow the true hydrophytes, and adjacent to them the hygrophilous plants. Glabrous external parts, no hairs and spongy internal tissue characterise these fen plants, which have been stated to represent the descendants of the more primitive members of our flora.

The wide expanse of Figham Common yields a large number of partially submerged plants, and the list might easily have been extended had time permitted a wider investigation.

The deep ditches shelter *Sparganum simplex, S. ramosum, Hippuris vulgaris, Myriophyllum verticillatum, Mentha aquatica, Alisma Plantago, Sium erectum, Veronica Beccabunga, Hottonia palustris, Glyceria aquatica, Scrophularia aquatica,, S. nodosa, Equisetum palustris, E. limosum, Oenanthe fistulosa, Allium vineale, Potamogeton cripsus* and *Callitriche obtusangula.*

* This idea seems new to us. Possibly the writer is a native of Lincolnshire! We usually look upon Lincolnshire as 'Holderness South of the Humber.'—Ed.

In the currents occur *Glyceria fluitans*, and *Eliocharis acicularis* var. *longicaulis*, whilst the sides and banks of the channels and the adjacent land yield *Ranunculus Flammula, R. Lingua, R. sceleratus, Carex riparia, C. inflata, C. Pseudo-cyperus, C. vesicaria, C. disticha* and *Spiraea Ulmaria*. Patches of *Eupatorium cannabinum, Valeriana sambucifolia, Conium maculatum, Galium Aparine, Caucalis daucoides, Linum catharticum, Pulicaria dysenterica, Epilobium hirsutum, Geranium dissecta, Lysimachia Nummularia* and *Alopecurus geniculatus*, populate the better drained positions of the Common. *Asplenium Ruta-muraria* thrives on the bridge over Beverley Beck.

Swine Moor, a mixture of low lying fen and damp pasture resembling Figham Common lies close to the Hull river. Patches of *Nardus stricta* occur, and the substratum is distinctly peaty. It is alkaline rather than acid, and evidences of the oak are traceable. From the moor the river winds through flats, deeply fringed with a wealth of hydrophytes. The character common to all is that the dominant, mainly monocotyledonous, plants, which give the stamp to the vegetation are tall, slender, upright, and unbranched. In almost every species there is a recurrence of the same habit, which thus suggests an adaptation of obscure significance. It may, however, be pointed out that these tall slender shoots easily bend to breeze or current and elastically recover ; this is specially true of the unbranched stems of plants such as *Scirpus palustris*, or the tall, long leaves projecting above the water from the stems of *Typha* and *Sparganium*. Nearly all the species are perennial herbs, or, like *Ranunculus sceleratus*, biennals. Special hibernating and propagative organs are produced by *Sagittaria*, in the form of stem tubers on runners. An occasional woody plant such as *Salix cinerea* or *Alnus glutinosa* occurs at intervals.

On the high bank separating the Hull from the land are *Sonchus arvensis, Galeopsis speciosa, Lathyrus pratensis, Vicia Cracca, Scabiosa succisa* merging down towards the river into patches of *Spiraea Ulmaria, Lysimachia vulgaris, Lythrum Salicaria, Thalictrum flavum, Equisetum palustre, Senecio palustre, Hypericum tetrapterum* and finally Iris, *Phragmites vulgaris, Phalaris arundinacea, Carex Pseudo-cyperus* and *C. riparia*.

Broken only by a very few patches of dry light soil growing oats, barley, and mustard, the land slopes away from the stream into ditch and bog where a luxuriant crowded flora exists. Pulfin Bog, a vestige of what has probably been a very much larger swamp, is the home of a profuse growth of marsh plants. *Salix pentandra* is the chief woody plant flourishing there, the remainder of the ground being totally obscured by *Phragmites, Glyceria, Typha, Iris*, and *Calamagrostis*, or by large masses of *Spiraea Ulmaria* and *S. filipendula*.

The smaller herbs include *Potentilla palustris, Scutellaria galericulata, Achillea Ptarmica, Galium palustre*, var. *Witheringii, Pedicularis palustris, Stachys palustris, Lotus uliginosus* var. *glaber, Angelica sylvestris, Mentha aquatica, Myosotis palustre, Senecio palustre, Valeriana officinalis, Lysimachia vulgaris, Juncus communis, Hyperisum quadrangulum, Lathyrus palustris, Lastraea* (*Dryopteris*) *Thelypteris, Carex dioica* and *Equisetum limosum*.

The woodlands of the district are small. *Centaurium umbellatum* and *Serratula tinctoria* grow in the Bygott Wood district. Westwood, situated on a rise of ground to the south-west of Beverley is undoubtedly the remains of a more extensive wood which has disappeared largely by cutting and grazing. Here, the Oak is dominant and Ivy abundant over a scanty undergrowth. The Oaks are of a great age, covered in many cases with masses of ivy and forming a very close canopy.

A visit to Dalton Wood by a few naturalists resulted in the discovery of a slightly different type of woodland. Barberry in fruit, *Arum maculatun* and *Campanula latifolia* grow here.

Mr. W. H. Burrell adds that Bygott Wood, which has been felled, was a jungle of herbaceous vegetation, fine growths of *Calamagrostis lanceolata* occur with *Epilobium angustifolium, Juncus communis*, Bracken and Bramble. Guelder Rose was in fruit and gorse was rejuvenating apparently from seed.

Mosses.—Mr. W. H. Burrell writes that the only mosses on Figham Common were *Amblystegium filicinum, Physcomitrium pyriforme, Webera carnea, Leptobryum pyriforme* and *Funaria hygrometrica*. In Bygott Wood the most interesting moss was *Hypnum riparium*, fruiting when out of water. Other mosses included *Polytrichum formosum, Catharina undulata*, and *Dicranella heteromalla*. *Mnium hornum* was unexpectedly scarce, perhaps suppressed or obscured by the dense growth of vegetation.

Mycology.—Mr. A. E. Peck writes :—Figham Common, a damp and rather coarse pasture, proved rather poor ground for the Mycologist, and the same may be said of Swinemoor.

Westwood was somewhat better, one reason being that its 600 odd acres includes several coppices, which, however, are chiefly of Hawthorn and Oak. The absence of Beech and coniferous trees probably accounts for the limited fungus flora of this delightful area.

Volvaria Taylori picked up from the ground by Mr. Winter at Newbegin Pits was a good find, whilst *Polyporus dryadeus* on an Oak trunk in its usual condition of exuding drops of water towards the edge of the pileus, was the only tree parasite here noted.

On Tuesday a small party visited Dalton Holme, and with kind permission of the occupier of the Hall, visited the avenues of fine old Beech trees which partly enclose the extensive and famous lawn.

Here was found quite a little paradise for the fungus hunter. Hunting, actually, was out of the question, as new things appeared at every step, and exclamations of surprise and delight were frequent.

The extensive and diversified list hereafter appended speaks for itself, but a few comments may be of interest.

Polyporus giganteus grew in fine clusters or rings at half-a-dozen points, probably from the buried stumps of ancient Beech trees.

Armillaria mucida, the 'Beech Agaric,' slimy, but edible, grew on one Beech which was still standing, but apparently quite dead, as it was destitute of foliage. Under the torn and split bark all round was found the black cord-like mycelium always ascribed to *A. mellea*, and the question is suggested as to whether the sporophores which we know as *A. mucida* sprang from this mycelium.

Armillaria mellea is a destructive tree parasite which also grows upon the ground. Its black mycelium is said to travel in the ground from tree to tree, and its sporophores occur on a variety of trees, but apparently not on Beech. The question may be put thus :—Is the Beech immune from attacks of *A. mellea*? Or, again, if *A. mellea* successfully makes a Beech tree its host, are the fruit-bodies produced those which we call *A. mucidia*? If there be good ground for the suspicion here mentioned, *A. mucida* would be reduced from its specific rank to become only one more variety of the many forms which *A. mellea* is known to assume.

The possibility to which I have given expression may already have received consideration and may even have been discredited, but I believe that it is now accepted that there are many analogous cases in the *Polyporeae*, and it may not be without significance that no description of the mycelium of *A. mucida* occurs in any of the text-books with which I am familiar.

The *Amanitas* alone made a good show with *A. rubescens* ('the Blusher') predominating.

Lepiota polysticta claimed careful examination.

The Chanterelle, *Cantharellus cibarius*, an edible of rich orange colour, grew in quantity.

Pluteus phlebophorus, a pink spored Agaric, with raised lines on the pileus which form a network at the deep-brown almost black centre and taper off towards the margin, was exceptionally interesting, the character named being so unusual in the Agaricineae, if not indeed unique.

The ' Horn of Plenty,' *Craterellus cornucopioides*, an edible said to be of fine flavour, was here, but its sombre tones rendered it inconspicuous amongst its many more gaily coloured companions.

A ' Giant puffball,' *Lycoperdon bovista* L. had been kicked to pieces by those who evidently did not know what a good dish this would have provided if sliced and fried. A good-sized ' giant ' will provide a fair helping for a dozen persons.

Below is a list of species found during the excursion :—

FIGHAM COMMON.

Tricholoma carneum
Hygrophorus conicus
Marasmius oreades
Pluteus salicinus on Willow stumps
Psalliota campestris
P. arvensis
Stropharia semiglobata
Psilocybe ericaea
Coprinus niveus
Polyporus hispidus
Puccinea Lolii Niels. on Glyceria aquatica retarding growth and preventing the plant from flowering.

SWINEMOOR.

Mycena pura
Marasmius oreades
Hygrophorus conicus
Stropharia semiglobata
Psilocybe semilanceata
Anellaria separata

WESTWOOD

Lepiota procera (Newbegin Pits).
Collybia radicata
Hygrophorus chlorophanus
Marasmius oreades
Lactarius blennius
L. quietus
Russula vesca
R. cyanoxantha
R. emetica
R. citrina
Volvaria Taylori (Newbegin Pits)
Entoloma jubatum
Clitopilus stilbocephalus
Galera tenera
Naucoria temulenta
Psalliota arvensis
Stropharia semiglobata
Hypholoma fasciculare
Psilocybe semilanceata
Coprinus atramentarius
C. micaceus
C. ephemerus
Coprinus plicatilis
Boletus chrysenteron
Polyporus dryadeus on Oak (Burton Bushes)
Poria medulla-panis
Stereum hirsutum
Lycoperdon bovista

DALTON HOLME.

Amanita pantherina
A. solitaria
A. rubescens
A. spissa
Amanitopsis vaginata
Lepiota cristata
L. polysticta
Armillaria mucida on dead Beech
Tricholoma argyraceum
Clitocybe fumosa
Laccaria laccata
L. laccata var. *amethystina*
Collybia radicata
C. fusipes
Hygrophorus conicus
H. chlorophanus
Lactarius blennius
L. acris
L. theiogalus
L. subdulcis
Russula nigricans
R. cyanoxantha
R. foetens
R. emetica
R. ochroleuca
R. alutacea
Cantharellus cibarius in quantity
Marasmius rotula
Pluteus phlebophorus
Entoloma ameides in pasture
E. prunuloides under Beech
Clitopilus orcella
Inocybe rimosa
I. geophylla
I. destricta
Cortinarius (Myx.) *elatior*

Cortinarius (Derm.) *cinnamomeus*
Psalliota arvensis
Hypholoma fasciculare
H. velutinum
Coprinus plicatilis
Boletus chrysenteron
B. subtomentosus
B. luridus
B. calopus
B. rubiginosus
Polyporus giganteus
Fomes annosus
Daedalea confragosa on dead beech
Polystictus abietina
Poria vaporaria
Craterellus cornucopioides
Thelephora palmata
Soppiltiella fastidiosa (Fr.) Mass.
Clavaria vermicularis
C. cristata
Calocera cornea
Lycoperdon bovista (L.)
L. pyriforme
Bulgaria polymorpha on living, but decayed, Beech.
Xylaria polymorpha at Beech roots.

——: o :——

Man for October contains a summary of the papers bearing upon Anthropology which were read at the Cardiff Meeting of the British Association.

Camping for September is a particularly interesting number, and the nature of its contents has probably much to do with the long list of new members printed on the cover.

The Entomologist's Record for October contains a description of 'A new species of Ant *Cardiocondyla britteni*, imported into England,' by W. C. Crawley, and 'The Phoresy of Antherophagus,' by H. Donisthorpe.

Among the contents of *The Entomologist* for October we notice a paper 'On the Abundance of the Larvæ of *Pyrameis atalanta*,' by G. F. Mathews. There are also numerous short notes recording interesting captures.

W. S. Berridge writes on 'Leaf and Stick Insects'; M. G. K. Bell on 'Birds in the Garden'; A. M. Long on 'Seals in the West of Ireland'; and S. L. Bastin 'A New Kind of Aquarium,' in the *Animal World* for October.

The Journal of the Ministry of Agriculture for October contains a paper on 'The Life History of the Common Mole,' by L. E. Adams, in which he states that observations seem to point conclusively to the fact that the mole is practically blind.

The Entomologist for November includes continuations of valuable papers already referred to in these columns, and among the other contents are 'On Some Variations of *Aphantopus hyperanthus*,' by H. D. Ford; 'Duration of Stages of *Pyrameis atalanta*,' by F. W. Frohawk; 'Notes on British Neuroptera in 1919,' by W. J. Lucas; 'New and Rare British Aleurodidæ,' by J. W. H. Harrison.

An interesting article on the Black-tailed Godwit, by E. L. Turner, appears in *British Birds* for October, in addition to which are some notes on the Nesting of the Nuthatch, by A. H. M. Cox, and some Notes on Diving Ducks, by C. E. Alford. The November issue has a well illustrated paper on the 'Black Tern,' by E. L. Turner, a photograph of a flock of Glossy Ibises in Cornwall, and the usual sheaf of useful notes.

The Essex Naturalist is a publication which is always interesting, on account of the scientific and local character of its contents. Vol. XIX., Part 3, is to hand, and besides the usual accounts of the Club's meetings, contains the following papers, many of which are well illustrated:— 'Some Field Observations on Essex Reptiles and Amphibians,' by F. J. Stubbs; 'The British Yellow Wagtails,' and 'On Conifers Grown in Suburban Gardens: A Presidential Address,' by Miss Gulielma Lister; 'On Insects Sucking the Sap of Trees,' and 'Notes on a Hornet's Nest from Chignal St. James,' by Charles Nicholson; 'Recent Discovery of a Dene-hole at Grays,' by P. Thompson; and 'British Oysters; Past and Present,' by A. Bell.

YORKSHIRE ZOOLOGISTS.

THE Annual Meeting of the Vertebrate Section of the Yorkshire Naturalists' Union was held at the Leeds Institute on October 23rd.

The Sectional Meeting was preceded by Meetings of the Wild Bird and Egg Protection Committee, at which Mr. W. H. St. Quintin, J.P., presided ; and the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee, at which Mr. S. H. Smith presided.

On taking the chair, Mr. Smith paid an eloquent tribute to Mr. A. Haigh Lumby, the retiring president, for his services, and also expressed the appreciation of the Section for the untiring efforts of Mr. W. Greaves, the retiring Secretary.

Mr. H. B. Booth read some notes on ' The Breeding Status of the Black Headed Gull in the British Isles,' by Robert Gurney.

The twelve Yorkshire colonies referred to in this paper were discussed. The only colonies at present in this county appear to be at Fly Flats, Semerwater, Keighley Moor, Barden Reservoir, one near Keasden, a doubtful one near Tebay, at Hebden Bridge, Fairburn (near Castleford), Skipwith and Thorne Moor. The Gulleries at Grassington and Strensall no longer exist.

Mr. Booth asked for all the information possible about existing Yorkshire Gulleries in order to compile an accurate list.

Mr. R. Chislett asked on what grounds it was assumed that this species is increasing when the new gulleries appeared simply to replace others which became unoccupied. Was it not possible that the birds merely changed from one locality to another?

Mr. A. Haigh Lumby opined that this bird had greatly increased in numbers in the Bradford district. Mr. E. W. Taylor drew attention to the small gulleries which are established from time to time on the moors for short periods, and which made the compilation of a complete list of gulleries difficult.

Mr. R. Chislett read a paper on the Nightingale, illustrated by a splendid set of lantern slides. The notes and photographs were made in Suffolk, where thirteen nests were found around the outskirts of one small wood. They were not difficult to find as the cock bird always sang in the neighbourhood of the nest. Twelve of the nests contained five eggs and one contained three ; all the eggs were hatched with the exception of one addled clutch.

The Nightingale was found to be a difficult bird to photograph and to be more suspicious than most of the Warbler family. One of the most beautiful photographs showed the cock bird with wings and tail extended in the act of display ; this occurred when the hen bird flew direct to the nest. The lecturer remarked that his first impression on hearing the song of the Nightingale was one of disappointment, but that later, when he fully realised the wonderful richness of tone and variety of expression he no longer wondered that it was regarded as our most brilliant songster.

Mr. Chislett also showed some fine photographs of the Ring Ouzel.

Mr. J. Atkinson read a paper on the Grey Wagtail, illustrated by photographs taken near Bolton Abbey. He drew attention to the way in which both parent birds removed the excreta from the nests and deliberately placed it in the stream.

Several of the photographs illustrated this habit, and others were shown of the birds perching on stones in the stream.

Mr. R. Fortune outlined the conditions under which permits were issued to collectors in the Canadian Wild Life Sanctuaries, before any specimens may be taken. Some similar system was thought to be very desirable in this country. He further appealed to members to send notes and records to *The Naturalist*.

A hearty vote of thanks was passed to the lecturers, the lanternists, the Leeds Photographic Society for the use of their room, and to Mr. J. Atkinson for making the necessary arrangements.—WILFRED TAYLOR.

FUNGUS FORAY AT HELMSLEY (1920).

A. E. PECK.

THE Annual Fungus Foray organized by the Mycological Committee, held Sept. 11th to 16th, constituted the 289th Meeting of the Yorkshire Naturalists' Union, and was the best attended and most successful of recent years. The following members were present :—Harold Wager, D.Sc., F.R.S., Chairman of the Committee (Leeds) ; W. N. Cheesman, J.P. (Selby) ; M. Malone (Bradford) ; J. Ackroyd (Batley) ; J. W.

Photo by] [*A. E. Peck.*

(*Standing, from left*) :—R. FOWLER JONES, MRS. PECK, J. W. H. JOHNSON, MRS. FYSHER.
(*Seated, from left*) :—GREEVZ FYSHER, MISS FYSHER, W. N. CHEESMAN, H. WAGER, BELGIAN GUEST OF FYSHERS, F. A. MASON, A. E. PECK.

H. Johnson, M.Sc., (Walton) ; R. Fowler Jones (York) ; Wm. Bellerby (York) ; F. A. Mason (Leeds) ; Greevz Fysher (Leeds) ; and A. E. Peck, Hon. Sec. (Scarborough). Mrs. Peck, Mrs. Fysher, Miss Hypatia Fisher and a Belgian lady friend were also present. Letters regretting inability to attend had been received from Messrs. A. Clarke, Thos. Hebden, Thos. Smith and Sir Henry C. Hawley, Bart., the latter unfortunately giving little hope of further association with Yorkshire Mycology on account of residence so far away.

The headquarters were at the Black Swan Hotel, and the party found everything to contribute to their well being and

comfort. A large room, often used as a ball-room, was placed at the disposal of the Committee and was found very suitable indeed as a work-room for the examination and determination of specimens and their exhibition, with names attached, on the tables. As the variable weather of our country determines in great measure the time of year at which our various species of Fungi appear, it is always advisable to record the conditions which have prevailed over a period preceding a Fungus Foray. Exceptionally heavy rains were fairly continuous from mid-June to mid-August, since which fine weather, but with occasional rains, has been the rule. The result has been that whilst farmers generally got their hay crops in an impoverished condition, and others had it wasted completely, the Fungi came up exceptionally early and flourished abundantly from early July onwards, as was testified by members from their respective districts.

There is no doubt, therefore, that many species common to the Helmsley district had already come up and disappeared prior to our meeting.

Beckdale was first explored. *Tricholoma album* was here found in quantity, and it was a new acquaintance to most of us. The county records of this species are very few. *Clavaria cinerea* grew abundantly, whilst the much rarer *Clavaria botrytis* was a good find. Fine clusters on thick and fleshy basal stems were gathered and photographed.

The small pure white *Lepiota seminuda* was found here, whilst a strong contrast in colour was *Leptonia euchora* of a uniform rich violet-blue in all parts. This grew from a hazel root—its usual habitat—and was much admired. Next morning its glory had departed. The rich colour had faded and the specimens were more or less shrivelled up.

Eccilia atropuncta, another pink-spored Agaric, also occurred here with its remarkable raised black dots on the upper part of the stem. This unusual character rendered it easy of identification. Fine examples of the spined puff-ball *Lycoperdon echinatum* were gathered, whilst a large 'ring' of *Clitocybe nebularis* in fine clean condition, growing under Beech, its mycelium matting together the thickly fallen leaves, was gathered, and proved a much appreciated dish at breakfast the following day.

Fistulina hepatica, the ox-tongue or beefsteak fungus, which grew on an Oak tree, was also here gathered for the table. It was served for breakfast, fried in somewhat thick slices, but, unfortunately, without any indication or mention of its identity. A lady member thought she recognized it as venison, and served out portions as such. Now, 'vegetable beefsteak' may be eaten and even appreciated in a Mycological company in its true character as a fungus, but if served as venison the

result cannot be satisfactory. Though none discovered the identity of the dish by their sense of taste, all who tried it felt that they had got something which they could not rightly appreciate as venison, and it was not until the meal was over that its true character was ascertained.

Duncombe Park and the dells surrounding the deer-park came in next for survey. Here the older specimens of the fine Beech trees were found to be afflicted by the presence of that rather charming agaric *Armillaria mucida* which was also found growing upon dead Beech trunks. In the hollow

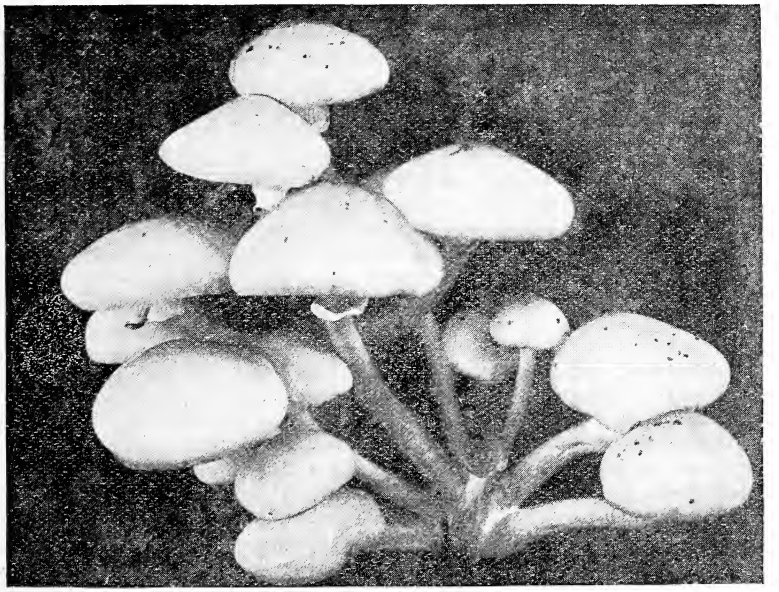


Photo by] [*A. E. Peck.*

***Armillaria mucida*, a Parasite of Beech Trees.**

centre of one prostrate trunk, upon which sporophores grew, was found black cord-like mycelium and black incrustations upon the decayed wood.

At a spot about 200 yards away luxurious clusters of *Armillaria mellea* were found. The last-named species is known to have a black cord-like mycelium, and the writer again wonders whether there is not an association between these two species of *Armillaria* (see Report of the Beverley Meeting, *ante* p. 393).

On other Beech trees were seen remarkably fine specimens of the polypore *Fomes fomentarius*. For colour and shapely proportions the writer has seen nothing to equal them. The

same fungus growing on Oak in this district is a miserable amorphous thing in comparison.

Polyporus frondosus, a big cluster at the foot of an Oak near the head keeper's residence, was exceptionally interesting. This district is unusually rich in polypores, no fewer than 12 species of the genus *Polyporus* being met with.

Under the Beech trees we also found the somewhat uncommon *Tricholoma saponaceum* (variety *squamosum* Cooke) with well marked squamules on the stems.

Psalliota arvensis and *P. sylvatica* grew in the deer-park,

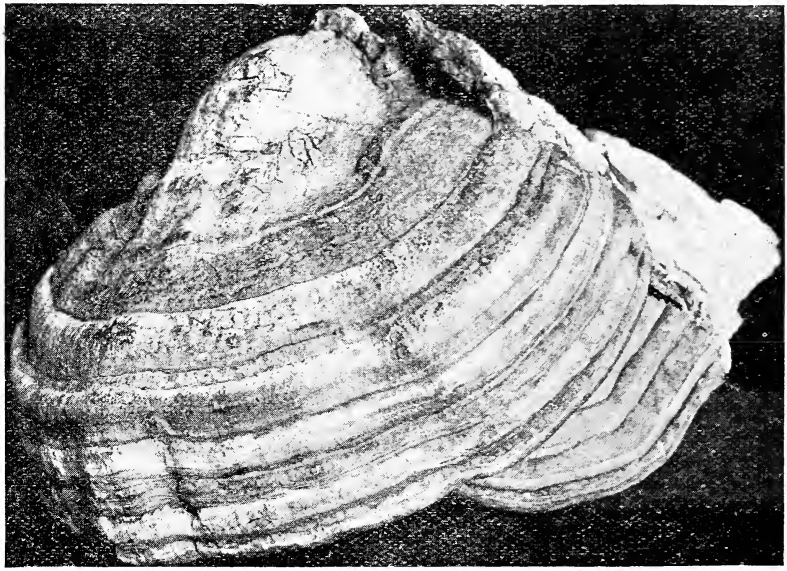


Photo by] [*A. E. Peck.*

***Fomes fomentarius*, a Parasite of Beech and other trees.**

but the common mushroom *P. campestris* was not seen anywhere throughout our visit. The Hedgehog Mushroom, *Hydnum repandum*, and the Chanterelle, *Cantharellus cibarius*, grew in quantity on mossy ground under the shelter of the friendly Beech trees and were gathered for the pot. Another edible, the 'Horn of Plenty,' *Craterellus cornucopioides*, was also observed here, and Mr. Mason found a specimen of the rare *Helvella helvelloides*, which may be likened to a stipitate peziza.

On Wednesday, Mrs. Greevz Fysher found specimens which were at once pronounced to be a yellow form of *Hygrophorus calyptraeformis*, and a critical examination of a dozen specimens by a number of members confirmed this determina-

tion. In the typical form the cap of *H. calyptraeformis* is of a beautiful light rose colour, whilst the gills and stem are white. A wholly white variety is known. In the specimens under notice the cap and stem were yellow with a tinge of green when fresh, whilst the gills were white. Like the type form the specimens were fragile and impossible of preservation. This appears to be a distinct form, and has been named *Hygrophorus calyptraeformis* variety *luteovirens* Wager and Peck. The specimens were gathered on or about the Terrace in Duncombe Park, but a second visit failed to discover more.

The terrace at Rievaulx was visited in the hope of finding *Entoloma Farrahi*, but the attempt failed. One specimen of *E. ardosiacum*, a very near species, was the best result obtained. The form and colour were similar, but the shape of the spores was not the same.

On Wednesday, Mr. Wroot, of *The Yorkshire Post*, visited our Headquarters, and the impressions which he received are contained in an article in the issue of that journal for Thursday, September 16th. As usual the evenings were mainly devoted to Lectures and Discussions.

Dr. Wager gave 'Notes on the Classification of the Agaricaceæ,' which will probably be published in full later. He also gave an address on 'Geotropism of the Fungi.'

Mr. Cheesman gave 'Some Observations on the Spores of Cryptogamia.' The writer gave an account of the Mycological contributions to *The Naturalist* during the last 35 years, with occasional extracts. These proved to be highly interesting, and it was thought desirable that an article on this subject should be published in *The Naturalist*.

In the work of determination of species, Mr. Cheesman dealt chiefly with the Myxomycetes, Mr. Malone with the genus Mycena, and the Discomycetes, and Mr. Mason with the Microfungi. Mr. Mason compiled an excellent list of 85 species, many of which were collected from local gardens, etc. Of these no fewer than 17 are new records for Yorkshire.

The total number of species and varieties met with throughout the Foray was 348. This compares with the total of 430 recorded in 1903, of which number, however, 44 were not seen during the Foray, but had been sent to Mr. Crossland for determination by Mr. H. Slater, the schoolmaster, during the summer. The following list contains only those species and varieties of more than usual interest. Of these 107 marked * are new to the Helmsley district, 25 marked † are new to Yorkshire, and 1 variety marked ‡ is new to science.

**Lepiota Badhami.*
**L. seminuda.*
Armillaria mucida.
Tricholoma flavobrunneum.
**T. argyraceum.*
†T. saponaceum var. *squamosum* (Cooke).
T. album.
T. stans.
**Mycena parabolica.*
M. vitilis.
**M. cruenta.*
**Omphalia pyxidata.*
†O. umbratila.
**O. fibula* var. *Swartzii.*
**Pleurotus spongiosus.*
**P. ostreatus.*
**Hygrophorus eburneus.*
**H. nemoreus.*
‡H. calyptraeformis var. *luteovirens* (Wager and Peck).
**Lactarius flexuosus.*
L. pergamenus.
**L. piperatus.*
**L. theiogalus.*
**L. fuliginosus.*
**Russula olivascens.*
**R. foetens.*
†R. ochroleuca var. *claroflava.*
**R. citrina.*
**Marasmius Wynnei.*
**Pluteus nanus* var. *lutescens.*
**Entoloma nidorosum.*
**Leptonia euchroa.*
**Eccilia atropuncta.*
**Pholiota erebia.*
**P. togularis.*
P. adiposa.
**Inocybe flocculosa.*
**Hebeloma sinuosum.*
**H. fastibile.*
**H. nauseosum.*
**Flammula flavida.*
**Galera ovalis.*
Cortinarius (Myx.) *elatior.*
C. (Ino.) *violaceus.*
C. (Derm.) *cinnamomeus.*
**Paxillus lividus.*
**Hypholoma capnoides.*
**Psathyra bifrons.*
**Coprinus fimetarius* var. *cinereus.*
**Boletus elegans.*
B. laricinus.
**Polyporus picipes.*
P. elegans.
**P. frondosus* (at Oak foot).
P. giganteus (on Beech stump).
**P. epileucus.*
P. caesius.
**P. fumosus.*
Polyporus hispidus (on Ash).
P. dryadeus (on Oak).
P. quercinus (on Oak stumps).
P. betulinus (on Birch).
Fomes fomentarius (on Oak and Beech).
F. annosus (on roots of Conifers).
**Polystictus velutinus.*
**Poria vitraea.*
**P. violacea.*
Daedalea quercina (on base of Oak gate post).
**D. ferruginea.*
**D. latissima.*
**Hydnum repandum* var. *rufescens.*
**Phlebia contorta.*
**Grandinia granulosa.*
Hymenochaete tabacina.
†Clavaria botrytis.
†Typhula incarnata.
**Lycoperdon perlatum.*
**L. echinatum.*
**Xylaria carpophila.*
†Hevella helvelloides.
**Peziza ochracea.*
†P. sterigmatizans.
**Otidea cochleata.*
**Lachnea umbrorum.*
**L. albo-spadicea.*
**L. dalmeniensis.*
Helotium virgultorum.
**H. fructigenum.*
H. calyculus.
**H. herbarum.*
**H. gramineum.*
**H. epiphyllum.*
**Mollisia melaleuca.*
**Uromyces flectens* (Legerh.) on *Trifolium repens.*
†Gnomonia erythrostoma (Auersw.) on Cherry trees.
†Mycosphaerella Brassicicola (Ld.) on Cabbage.
†M. Fragariae (Schweinitz) on Strawberry leaves.
†Venturia inaequalis (Aderh.) on Apple.
†V. pirina (Aderh.) on Pear.
†Phoma conigena (Karst.) on Spruce cones.
†Septoria Fragariae (Desm.) on *F. vesca.*
†S. Hederae (Desm.) on Ivy leaves.
†Sphaerotheca Humuli (Burr.) on cultivated Strawberry.
†Mucor racemosus (Fres.) on Owl pellet.
†Bremia Lactucae (Regel) on cultivated Lettuce.

†*Peronospora Dianthi* (De By.) on Carnations.
†*Monilia candida* (Bon.) Hansen on Owl pellet.
†*M. cinera* (Bon.) on Apple trees.
†*Penicillium expansum* (Thom.) on rotten fruit.
†*Botrytis cinerea* var. *sclerotiophila* (Raben.) Sacc. on capsules of Bluebell.
†*Cladosporium carpophillum* (Th.) on rotting fruit.
**Fumago vagans* (Persoon) on Camellia.
**Sclerotinia sclerotiorum* (Mass.) on Garden Peas.
**Ascochyta Pisi* (Lib.) on Garden Peas.

MYXOMYCETES.
**Badhamia utricularis.*
**Physarum viride.*
**Craterium minutum.*
**Didymium difforme.*
**Comatricha typhoides.*
**Trichia decipiens.*
**T. scabra.*
**T. persimilis.*
**T. Botrytis.*
**Hemitrichia vesparium.*
**Arcyria cinerea.*
**A. ferruginea.*
**A. pomiformis.*
**A. nutans.*
**Perichaena depressa.*
**P. corticalis.*
**Cribraria argillacea.*

——: o :——

YORKSHIRE NATURALISTS' UNION.

GEOLOGICAL SECTION.

THE Annual Meeting of the Geological Section was held on Saturday, October 16th, at the Leeds University, Dr. A. Gilligan presiding. The Secretary reported on the Section's work during the year and referred to the valuable assistance given by the late Dr. Wheelton Hind on the Skipton Excursion. The Officers and Committees were re-elected, and the name of the Rev. H. Thomas, of Huddersfield, was added to the Carboniferous Rocks' Fossil Flora and Fauna Committee.

It was decided to continue the investigation of the marine bands in the Millstone Grit and to arrange a sectional meeting in some favourable locality.

To assist members in this work a number of the zone goniatites were exhibited. Mr. Barker brought *Gastrioceras carbonarium* from the Lower Coal Measures, and *G. listeri* from the Upper Millstone Grit; Mr. Holmes, *Glyphioceras beyrichianum* from the Sabden Shales; and Mr. Bisat, *G. bilingue* and *G. reticulatum* from the Lower Millstone Grit.

Prof. Kendall exhibited another series of micro-sections of the whole thickness of the Barnsley Bed—this time from Warren House Colliery. The next annual meeting of the Section will be held at Huddersfield on the third Saturday in October, 1921.—J. HOLMES.

——: o :——

The Thirty-second Report of the Haslemere Natural History Society (11 pages) contains a record of the work accomplished, with brief notes on the excursions, etc. The Society is fortunate in having nearly £90 in hand.

The Report and Proceedings of the Belfast Natural History and Philosophical Society contains a paper on 'Trees—the Characters, Structure, and Properties of Wood, with notes on Forestry and Afforestation,' by A. Deane, which is well illustrated.

No. 26 of *The Report of the Felsted School Scientific Society* is to hand (46 pages), and is one of the best publications of a School Scientific Society we have seen. The various reports on Zoology, Meterology, etc., are on quite scientific lines. The observations made are of distinct value, and a photographic illustration of a 'Hedge-sparrow feeding young Cuckoo' is admirable of its kind.

In Memoriam.

WILLIAM HEWETT.

It is with deep regret that we record the death of Mr. William Hewett, which took place suddenly at York, on Oct. 27th last. Mr. Hewett was 58 years of age, and for 38 years had been an active member of the Yorkshire Naturalists' Union. Never in any sense a scientific naturalist, he was always an energetic field worker, and delighted in collecting. He was both ornithologist and entomologist, and made a speciality of collecting eggs of the guillemot and razorbill, his collection of the eggs of these birds being one of the finest in the Kingdom. Many too, perhaps all, of the other big collections of these eggs in Britain are indebted to Mr. Hewett for some of their specimens. To procure them had entailed many visits and holidays, year after year, of Mr. Hewett and his wife to the cliffs near Speeton during the breeding time, so as to be first able to select the eggs as they were brought up by the climbers. Occasionally he went down the cliff side himself in the usual rope and chair apparatus used for the purpose, and one part of the cliff at Buckton, indeed, has for years been known as 'Hewett's Swing.' As an entomologist he was interested in breeding varieties of the common large species of lepidoptera, such as *Smerinthus populi*, *S. tiliae*, *Odonestis potatoria*, *Chelonia caja*, etc. Some of the finest varieties, too, of *Abraxas sylvata* (*ulmata*) in British collections were taken by him at Sledmere; and he formed a good collection of lepidoptera generally. He also took a somewhat prominent part in the lively discussion many years ago in the entomological journals, as to the distinctness of *Tephrosia crepuscularia* and *T. biundularia*. For many years Mr. Hewett was one of the Secretaries of the Entomological Section of the Yorkshire Naturalists' Union, and had also been its President. For years, too, he was the Section's representative on the Committee of Suggestions for Research of the Yorkshire Naturalists' Union, and had been a member of the Executive Committee since 1906. In 1901 he was President of the York Field Naturalists' Society, and was also an honorary member of the York Philosophical Society. All his business life was in connexion with the North Eastern Railway Company at York, and since 1904 he had been on the Council of the North Eastern Railway Institute, in the library of which he took a deep interest, a library which, largely owing to his efforts, contains perhaps the best collection of books on natural history to be found in any similar institution in the British Islands. Mr. Hewett married a French lady, who survives him, and to whom we tender our sincerest sympathy.—G. T. P.

FIELD NOTES.

BIRDS.

Late Stay of Swift.—I saw a Swift flying over Doncaster on the morning of October 31st, an exceptionally late date for Yorkshire.—E. W. Taylor.

Great Crested Grebe.—A male of this species in winter plumage, was killed at East Cottingwith on October 30th, 1920. I have been able to secure it for the York Museum.—Sydney H. Smith.

Late Nesting of Ring-Dove.—Whilst 'fungusing' in a plantation, near Scarborough, on September 30th, a Wood Pigeon flew from a fir tree which I had passed shortly before. Judging that the bird would not have tolerated my near proximity unless it were sitting, I retraced my steps and found the nest about seven feet from the ground, containing two eggs, warm and deepset. One 'blooded' upon being pricked. At a meeting of the Scarborough Field Naturalists' Society the same evening, Mr. Gyngell exhibited eggs of the Wood Pigeon to illustrate his remarks that it was quite possible to go birdnesting in the autumn and not draw a blank. He had not such a late local record, however, as that now reported.—A. E. Peck, Scarborough.

Records of late nesting of Ring Dove are not unusual. They have been recorded nesting in practically every month in the year.—R.F.

Birds Mating for Life.—Arising out of Mr. Selous's views, 325-8, when snow was thick on the ground in March, 1917, some was swept away to put food down for a male and female Chaffinch which were usually sitting on a tree near my windows, and they fed there alone, *i.e.*, without others of the species. After a very hard frost one night, there was only the male next morning on the tree, and it fed alone for two days. The female, I then thought, had died from cold, because there was no sign of it in the garden near. On the third morning, two females appeared, to feed also, the male allowing them to remain undisturbed so long as they did not approach too close, but chased them whenever they came within a few feet, and would not let either sit on the aforementioned tree! The result was that these females departed permanently a few hours later. After they left, a female appeared which seemed to me undoubtedly the original which I thought to be dead, because the male greeted it on arrival, and they at once associated on the tree, and continued feeding happily together during the rest of the time that snow lasted. This seemed to show that some Chaffinches mate permanently for life.—Frederick D. Welch, M.R.C.S.

Ravages of Rooks.—A bad habit of Rooks is their destruction of chicks of the domestic fowl. I described in

Wild Life (1917, p. 83) that I had seen many dozens of chicks destroyed by Rooks (not Crows). They peck open the body of a chick a few weeks old, tear out the heart, lungs, etc., and carry them away for their young to feed upon. They also carried off hen's eggs in their feet. Several Rooks were shot in the act. They took the chicks by surprise, at it were, when the latter were searching for food in the grass. They would pretend to hunt about until within a yard or so of the chick, then make a sudden rush at it, hold it down with the feet, and attack it with its beak like a Nutcracker breaking nuts. Occasionally a Rook would carry off a live chick in its feet. Rooks do good in destroying wire-worms, etc., but they should be kept down to within reasonable numbers.—FREDERICK D. WELCH, M.R.C.S.

The habits of Rooks vary considerably in different districts, consequently it is not wise to condemn the entire race for the delinquencies of individuals in certain areas. It is easy enough to keep their numbers in check during the Rook shooting season, without destroying an extremely useful bird wholesale.—R.F.

Woodcocks carrying their Young.—Mr. W. H. St. Quintin, in writing to *The Field*, states that cases which have come under his own observation have been where the nests have been built on dry hill sides, the young in such cases being carried by their parent to the moister-feeding ground below; but where the nests are placed somewhere near their feeding-ground he has not observed this habit. Is it not a fact, however, that the Woodcock will frequently carry its young to a place of greater safety as the result of an intruder? I have only once witnessed this habit, and this is over thirty years ago, and occurred on the banks of Windermere, but the circumstances at the time led me to believe that the parent bird was transferring its young one to a place of greater safety. It has been known to carry its young away when only a few hours old, if an intruder has been about, and the young at this stage would require brooding more than food. No one could have had a better view of the habit than I had at Windermere. Some observers allege that the parent carries its young by clasping them between its feet, which it may do on occasions. The one I saw had its young between its thighs and pressed close to its belly, and its hind quarters were very much depressed, so as to make it look very comical when flying. This habit was stoutly denied for many years. Even Gilbert White could not accept the fact, but this perhaps can be understood when in his day it was asserted that the young Woodcock was carried from place to place in its beak.—E. P. BUTTERFIELD.

Mr. St. Quintin's interesting letter appeared in *The Field*

for October 2nd. A communication from another correspondent in the same paper for October 16th gives two recent instances of Woodcock carrying their young, obviously from danger, in wet districts, in the New Forest. He also rightly points out that there are no records to show how many of the observed instances of these birds carrying their young were in wet or in dry districts.—R.F.

—: o :—

ENTOMOLOGY.

Dytiscus circumflexus in Yorkshire.—It is not often we quote the daily papers for a new Yorkshire record, but in a column headed 'A Nature Lover's Diary. Bird Life in 1920,' in *The Yorkshire Post* for October 28th, we learn that several examples of *Dytiscus circumflexus* were observed by some schoolboys in some slightly brackish ponds on the Humber foreshore to the east of Hull. Mr. T. Stainforth has since presented some of the specimens to the Museum at Hull, so there is no doubt of the accuracy of the report. The same column contains some interesting notes on the relative frequency or scarcity of certain coleoptera in East Yorkshire.—Ed.

Theobaldia arctica Edw. in Yorkshire.—In a recent issue of *The Scottish Naturalist*, Mr. F. W. Edwards recorded and described an additional British Mosquito under the above name, as occurring in two or three localities in Scotland. A female taken at Austwick Moss, 18th May, 1919, seemed to agree with the description, and was submitted to Mr. Edwards, who kindly verifies it as this species. At the same time he verified *Dixa nebulosa* Mg. and *Dixa puberula* Lw. from the same locality, which are also county additions. *Corethra plumicornis* Fab., now known as *Chaoborus crystallinus* Deg., from Austwick, he puts under the var. *fuscus* Staeg.; specimens from Gormire being intermediate between the var. and the type.—Chris. A. Cheetham.

Spiders *versus* **Bee and Wasp.**—Some time ago I observed a hive-bee, a worker, caught in a spider's web, and I watched the fight. The Spider, a large one, approached by a rather circuitous route, presumably to avoid the sting, and had little difficulty in getting the bee by the head-part and wrapping it all over with web. I have several times found a 'drone' hive-bee dead in a spider's web. A very large spider killed a wasp in fair fight in 1919 summer in the same way, and with a rapidity which seemed to suggest it had killed them so before. Personally I doubt if one would attack a hornet! But with a wasp in a web of a medium or small-sized spider, my experience has been that the wasp usually breaks away

before being completely caught—usually by the spider hesitating a few seconds before attacking it.—FREDERICK D. WELCH, M.R.C.S., Hartley, Kent.

Abundance of Red Admiral Butterflies in Yorkshire.—On the 8th of October, whilst at Bolton Bridge, Wharfedale, an opportunity was afforded me of confirming one of the large flights which are being recorded of the Red Admiral Butterfly. Within a space of two feet square, on clumps of Michaelmas Daisies, there were no fewer than fourteen of these insects pirouetting in the sunshine. It has been suggested that these large flights may be blown from the Continent by the wind, but all these were in the pink of perfection, and there was not a torn specimen amongst them. The oldest records make mention of 'periodic flights' of the Red Admiral Butterfly, and it is but a few years ago that the Leeds papers were recording local flights of this insect.—JAMES E. BEDFORD, Headingley, Leeds.

These autumn specimens are, of course, chiefly the produce of the spring immigration. See *The Naturalist* of August last, pp. 268-269.—G.T.P.

—: o :—

FUNGI.

Mycena atrovirens, **a new Agaric discovered in Yorkshire.**—While collecting fungi at Roundhay, Leeds, in October of last year, I gathered a specimen of a small greenish-coloured Mycena with green, denticulate gill edges, which I was unable to recognise from any description in the British Floras. For identification it was forwarded to Mr. Carleton Rea, who informed me that the species was unknown to him, and commenting on Karsten's *M. viridomarginata*, which suggests a green margin to the edges of the gills, pointed out that otherwise the description of that fungus did not apply to the Roundhay specimen. Subsequent examination showed that the latter was an undescribed species, and in *Trans. Brit. Mycolog. Soc.*, VI., 1920, p. 323, it is fully diagnosed. *M. atrovirens* falls into the group Calodontes, and may readily be distinguished by the green edges of the gills. From the point of view of the 'Yorkshire Fungus Flora,' it is now recorded for Mid. W. Div. (V.C. 64), Roundhay, Leeds, October 26th, 1919, on decaying beech stump.—F. A. MASON.

——: o :——

No. 2 of *The Journal of the Wild Bird Investigation Society*, edited by Dr. W. E. Collinge, in addition to editorial remarks, short notes, correspondence, etc., contains the following papers :—'Is the Magpie an Injurious Bird,' by L. T. Thornton ; 'Wild Birds : their Relation to the Farm and the Farmer,' by W. E. Collinge ; 'Birds of the Wye Valley,' by Wm. Blake ; 'Pond Frequenting Birds as Seed Carriers,' by Rev. E. A. Woodruffe-Peacock.

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.

CONTRIBUTORS.

CONTRIBUTORS—*continued.*

BOOK NOTICES.

BOOK NOTICES—*continued.*

BOOK NOTICES—*continued.*

Societies.

Miscellaneous.

ILLUSTRATIONS.

NOTES AND COMMENTS.

NOTES AND COMMENTS—*continued.*

SPECIES AND VARIETIES NEW TO SCIENCE BROUGHT FORWARD IN THIS VOLUME.

FUNGI.

CHESHIRE.

Geology and Palæontology.—Bibliography with respect to the Geology and Palæontology of the North of England (Yorkshire excepted) during 1919, T. Sheppard, 67-71, 108-111

Lepidoptera.—Reports of Meetings of Lancashire and Cheshire Entomological Society, W. Mansbridge, 35

Personal Notices.—In Memoriam Notice of Hy. C. Beasley, 128

Societies.—Chester Society of Natural Science, Transactions of, 308; Lancashire and Cheshire Entomological Society, Report of Meeting of, 175

Zoocecidia.—Observations on British Zoocecidia, J. W. H. Harrison, 235-237

CUMBERLAND.

Coleoptera.—Note on the Occurrence of Atheta aubei Bris. and Cercyon lugubris Ol. in Cumberland, F. H. Day, 270; Anomala aenea De G. (frischi Fab.) and its cyaneous form in Cumberland, F. H. Day, 370

Flowering Plants.—Lepturus filiformis L. found at Skinburness, W. E. L. Wattam, 140; Ribes alpinum L. found near Cumwhitton, L. E. Hope, 239

Geology and Palæontology.—Bibliography with respect to the Geology and Palæontology of the North of England (Yorkshire excepted) during 1919, T. Sheppard, 67-71, 108-111;

Hemiptera.—A note on the dispersal of Monanthia cardui Linn, J. Murray, 106

Hemiptera-Heteroptera.—Supplementary list of species noted in Cumberland, including many new records, F. H. Day, 16-18

Mosses and Hepatics.—Lophozia porphyroleuca (Nees) Schiffn, and Conocephalum conicum (Linn.) Dum., in Cumberland, J. Murray, 352

Orthoptera.—Forficula auricularia L., var. forcipata Steph. at Great Corby, G. B. Walsh, 362

Societies.—Cumberland and Westmorland Antiquarian, etc., Society, Transactions of, 372

DERBYSHIRE.

Acari.—Plant Galls of North-east Derbyshire, E. & H. Drabble, 11-15

Bacteria.—Plant Galls of North-east Derbyshire, E. & H. Drabble, 11-15

Coleoptera.—Plant Galls of North-east Derbyshire, E. & H. Drabble, 11-15

Diptera.—Plant Galls of North-east Derbyshire, E. & H. Drabble, 11-15

Filices.—Galls on Ferns in North-east Derbyshire, E. & H. Drabble, 11-15

Flowering Plants.—Galls on flowering plants in North-east Derbyshire, E. & H. Drabble, 11-15

Fungi.—Plant Galls of North-east Derbyshire, E. & H. Drabble, 11-15

Geology and Palæontology.—A Study of the Stratigraphy of the Millstone Grit, W. S. Bisat, 53-58; Bibliography with respect to the Geology of the North of England (Yorkshire excepted), during 1919, T. Sheppard, 67-71, 108-111

Homoptera.—Plant Galls of North-east Derbyshire, E. & H. Drabble, 11-15; Triecphora vulnerata in North Derbyshire, J. M. Brown, 270-271

Hymenoptera.—Plant Galls of North east Derbyshire, E. & H. Drabble, 11-15

Lepidoptera.—Plant Galls of North-east Derbyshire, E. & H. Drabble, 11-15

Nematoda.—Plant Galls of North-east Derbyshire, E. & H. Drabble, 11-15

DURHAM.

Geology and Palæontology.—Bibliography with respect to the Geology and Palæontology of the North of England (Yorkshire excepted) during 1919, T. Sheppard, 67-71, 108-111; Note on an Exposure of Sands and Gravels containing Marine Shells at Easington, 300

DURHAM—*continued.*

Orthoptera.—Forficula auricularia L., var. forcipata Steph. at Middleton-in-Teesdale, 362

Zoocecidia.—Observations on British Zoocecidia, J. W. H. Harrison, 235-237

ISLE OF MAN.

Geology and Palæontology.—Bibliography with respect to the Geology and Palæontology of the North of England (Yorkshire excepted) during 1919, T. Sheppard, 67-71, 108-111

LANCASHIRE.

Geology and Palæontology.—A Study of the Stratigraphy of the Millstone Grit, W. S. Bisat, 53-58; Bibliography with respect to the Geology and Palæontology of the North of England (Yorkshire excepted), during 1919, T. Sheppard, 67-71, 108-111; A note on the 'Source of Trias Rock Materials,' P. F. Kendall, 245-246

Lepidoptera.—Reports of meetings of Lancashire and Cheshire Entomological Society, W. Mansbridge, 35; Series of Bryophila perla taken at Wavertree, 49

Museums.—Manchester Museum, Publications of (Nos. 82 and 83), 124

Personal Notices.—In Memoriam Notice of John Gerrard, F.G.S., M.B.O.U., 308

Societies.—Lancashire and Cheshire Entomological Society, Report of Meeting of, 175; Liverpool Biological Society, Transactions of, Vol. XXXIII., 8; Liverpool Geological Society, Transactions of (Part 4, Volume XII.), 211; Manchester Microscopical Society, Transactions of, 378; Rochdale Literary and Scientific Society, Transactions of, 15

Zoocecidia.—Observations on British Zoocecidia, J. W. H. Harrison, 235-237

LINCOLNSHIRE.

Geology and Palæontology.—Bibliography with respect to the Geology and Palæontology of the North of England (Yorkshire excepted), during 1919, T. Sheppard, 67-71, 108-111

Societies.—Lincolnshire Naturalists' Union, Transactions of, 1919, 320

NORTHUMBERLAND.

Geology and Palæontology.—Bibliography with respect to the Geology and Palæontology of the North of England (Yorkshire excepted) during 1919, T. Sheppard, 67-71, 108-111

NOTTINGHAMSHIRE.

Geology and Palæontology.—Bibliography with respect to the Geology and Palæontology of the North of England (Yorkshire excepted), during 1919, T. Sheppard, 67-71, 108-111; A note on the 'Source of Trias Rock-Materials, P. F. Kendall, 245-246; A note on the Fibrous Gypsum of Nottingham, 280

Lepidoptera.—Early appearance of Macroglossa stellatarum at Southwell, A. E. Hall, 168

WESTMORLAND.

Geology and Palæontology.—Bibliography with respect to the Geology and Palæontology of the North of England (Yorkshire excepted), during 1919, T. Sheppard, 67-71, 108-111

Societies.—Cumberland and Westmorland Antiquarian, etc., Society, Transactions of, 372

Zoocecidia.—Observations on British Zoocecidia, J. W. H. Harrison, 235-237

YORKSHIRE.

YORKSHIRE—*continued.*

YORKSHIRE—*continued.*

YORKSHIRE—*continued.*

YORKSHIRE—*continued.*

MISCELLANA.

MISCELLANA—*continued.*

CORRIGENDA.

Page 188, line two from bottom, *for* 'Gibson,' *read* 'Sibson.'
Page 271, line 20 from bottom, *for* 'montana,' *read* 'moneta.'
Page 321, line 17, *for* 'Mon,' *read* 'Moss.'

PLATES.

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
Dec. 1st, 1920.

THE

NATURALIST:

A

MONTHLY JOURNAL OF

NATURAL HISTORY FOR THE NORTH OF ENGLAND

EDITED BY

THOS. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.(Scot.).

Curator of the Municipal Museums, Hull.

Hon. Member of the Yorkshire Naturalists' Union; the Spalding Gentlemen's Society; the Doncaster Scientific Society; the Selby Scientific Society.

AND

THOMAS WILLIAM WOODHEAD, Ph.D., M.Sc., F.L.S.

Lecturer in Biology, Technical College, Huddersfield;

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

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

RILEY FORTUNE, F.Z.S.

1921.

LONDON:

A. Brown & Sons, Ltd., 5, Farringdon Avenue, E.C.4.

And at Hull and York.