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THE READING NATURALIST

No. 8 for the Year 1955 - 56

The Journal of
The Reading & District Natural History Society.

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Editorial

The year 1956 has been a memorable one for the Reading and District Natural History Society. It marked the 75th anniversary of the founding of the Society in 1881, during it a highly successful exhibition was held to celebrate the event, and in this year the "Reading Naturalist" has, for the first time, been prepared, duplicated and put together almost entirely by members of the Society with a minimum of outside help. This achievement was made possible by the gift of a duplicator, which was most generously presented by three members, and is one that not only justifies a sense of pride, but also permits quite considerable saving in expenditure. The actual work has mostly been done by members who are on the staff of the Reading Museum, and we extend our grateful thanks to them and to the Director for allowing them the necessary facilities, as well as to all our contributors.

Enid M. Nelmes.

Editor.

Honorary Recorders

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The Society's 75th-Anniversary Exhibition

To commemorate the 75th Anniversary of the founding of the Reading and District Natural History Society, an Exhibition illustrating some of the activities of the Society was held, by kind permission of the Museum Committee, in the Art Gallery during 1956. It was opened on 7th July by Professor H.L.Hawkins, who was introduced by the President, Mr. W.C.Fishlock, and continued until 1st August, three days later than was originally intended. Attendance of both children and adults was large and included many parties of school children.

The botanical exhibits comprised a herbarium collection of over 650 British flowering plants made by one of our junior members, which was also shown at the Annual Exhibition of the British Naturalists' Association in 1955; one of herbs with indications of their uses; cones from trees of 30 species; living specimens of British grasses in flower; some medicinal plants in the British Pharmacopoeia that grow wild near Reading, the latter also illustrated by photographs; pans containing growing plants characteristic of chalk, heath and bog, and roadside habitats; and some physiological experiments, including one in which a plant caused a bell to ring when it needed water. A link between the botanical exhibits and one of local fossil plant and animal remains and geological curiosities was provided by living specimens of surviving members of plant groups representative of previous eras. The nests of over 30 birds, as well as some skulls, feathers and pellets, were shown in the ornithological exhibit, which was illustrated by photographs and coloured pictures of birds that can be seen and heard each month, lent by Shell Mex Ltd. Entomology was represented by a large collection of pinned specimens illustrating the various insect orders and by photographs and examples of home-made apparatus for trapping, examining and preserving insect specimens. Living crustaceans, molluscs, insects, amphibia and fish from local waters were shown in tanks. There was also a Nature Quiz for which more than 60 entries, mostly from children under 16, were received. Nature films, some accompanied by records of bird song, were shown each day.

It is with pleasure that we offer our sincere congratulations to Mr. B.Baker and Mr. P.Hanney, both of whom have recently obtained the degree of B.Sc. in Natural Science at London University. Both received their first introduction to Natural History through this Society, of which they have been active members for many years, and both have for some years been engaged at Reading Museum, where much of their good work can be seen. Despite the calls upon their spare time, they travelled to London on most evenings after their duty at the Museum, and thus achieved their well-earned honour, -- a record for Corporation Officers.

STATION - READING UNIVERSITY.

HEIGHT ABOVE SEA LEVEL - 148 ft.

1955.

		JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	YEAR	
MEAN DAILY TEMPERATURE °F.	MAX.	42.1	40.7	46.7	58.7	59.2	67.2	75.3	76.3	68.2	56.9	51.0	49.1	57.6	
	MIN.	32.6	31.4	32.5	41.8	43.1	51.0	55.3	56.5	49.1	41.3	39.8	36.5	42.6	
	MEAN	37.3	36.1	39.6	50.3	51.1	59.1	65.3	66.4	58.7	49.1	45.4	42.8	50.1	
EXTREME TEMPERATURES °F.	E. MAX. DATE	54 10,30	53 7	62 25	66 11	69 30	76 6	87 17	89 22	79 1	69 10	62 4,5	57 28	89 Aug.22	
	E. MIN. DATE	18 15	20 20	24 20	31 2	34 18	39 10	47 2,4	43 8	38 19,29	27 31	27 1,30	25 19	18 Jan.15	
	E. GRASS MIN. DATE	8 17	12 28	14 2,20,21	21 2	25 22	33 10	37 2,26	33 7,26	31 19	19 18	20 2	21 19,22	8 Jan.17	
DAYS WITH " "	FROST	13	16	16	1	0	0	0	0	0	4	5	9	64	
	GROUND FROST	17	23	24	12	6	0	0	0	0	8	10	10	110	
SUNSHINE HRS (SEED TRIAL) GROUNDS	SUM.	33.3	79.7	158.1	173.1	199.4	170.8	255.0	196.8	149.0	109.7	55.8	36.8	1617.5	
	% POSS.	13	29	43	42	41	34	51	44	39	33	21	15	36	
	DAILY MEAN	1.07	2.85	5.10	5.77	6.43	5.69	8.23	6.35	4.97	3.54	1.86	1.19	4.42	
PRECIPITATION INS.	AMOUNT	2.98	1.43	0.95	0.32	4.38	2.17	0.17	0.44	1.80	2.88	1.85	2.37	21.74	
	RAIN D/ S	16	17	8	9	21	11	3	7	12	12	11	20	147	
	MAX. RAIN IN 1 DAY	0.74	0.41	0.30	0.14	0.92	0.59	0.12	0.21	0.83	0.95	0.44	0.44	0.95	
	DATE	13	4	22	7	16	3	3	11	22	19	3	11	Oct.19	
	LONGEST RUN OF CONSECUTIVE RAIN DAYS	5	5	5	3	10	4	1	3	3	7	7	11	11	
	LONGEST RUN OF CONSECUTIVE DRY DAYS	5	4	13	15	4	8	14	13	7	9	10	6	15	
	SNOW OR SLEET DAYS	8	14	5	0	2	0	0	0	0	0	0	0	1	30
	DAYS SNOW LYING	9	11	2	0	0	0	0	0	0	0	0	0	0	22
THUNDERSTORM ACTIVITY	DAYS OF THUNDER	0	0	0	0	3	0	3	1	3	0	2	0	12	
	DAYS OF HAIL	0	0	0	0	2	0	0	0	1	0	1	0	4	
AVERAGES. MEAN DAILY TEMPERATURE °F.	MAX.	45.2	46.3	51.8	56.9	63.7	69.2	72.3	71.5	66.8	58.8	50.2	45.7	58.2	
	MIN.	34.3	34.5	36.1	40.1	44.8	50.5	54.1	53.4	49.9	43.8	38.3	35.3	42.9	
	MEAN	39.8	40.4	44.0	48.5	54.3	59.9	63.2	62.5	58.3	51.3	44.3	40.5	50.6	
PRECIPITATION	AMOUNT	1.9	1.64	1.71	1.46	1.65	1.95	2.03	2.09	1.70	2.98	2.30	2.59	24.0	
	RAIN DAYS	15	13	13	12	10	10	12	13	11	15	15	15	153	

WEATHER RECORDS FOR 1955

Data supplied by M. Parry.

The data refer to Reading University Meteorological Station except those for sunshine, which were recorded at Sutton's Seed Trial Grounds. A "rain day" is a day on which rainfall exceeds only 0.01 ins. The temperature averages refer to the period 1921-50 and the rainfall averages to the period 1881-1915, and not 1800-1915, as inadvertently stated in the previous report.

Extracts from the Recorder's Report for Botany 1954-55

By K.I. Butler

(Nomenclature as in 'Flora of the British Isles' by Clapham, Tutin, & Warburg)

Despite continued cold weather during most of January, a few mild days at the end of the month brought the male catkins of the Hazel into flower by the 30th, but a renewal of cold weather from the middle of February onwards and through most of March kept back the early spring flowers, and the Hazel was still in flower at the beginning of April.

At the Society's Field Meeting on April 27th, Scrophularia vernalis L. (Yellow Figwort) was seen growing on a roadside bank between Woolhampton and Bucklebury. It is well distinguished by its remarkably green leaves and yellow flowers. It is of local occurrence, but not indigenous, being a native of Central and South Europe.

Members' Records

Stellaria palustris Retz (Marsh Stitchwort). Medmenham (Mrs. Paul). It could not be found this year near Great Lea Pond, Grazeley.

Geranium lucidum L. (Shining Crane'sbill). Padworth, where it is still growing strongly (Mr.C.E. Douglas); Shinfield (Dr.E.V. Watson) .

Trifolium striatum L. (Soft Trefoil), T. arvense L. (Hare's-foot), T. subterraneum L. (Subterranean Trefoil), all abundant at Coleman's Moor (Mrs. Simmonds).

T. striatum at Tilehurst. (J. Hodgson).

Saxifraga tridactylites L. (Rue-leaved Saxifrage), first located on a brick wall near Grazeley in 1949, was seen to be growing freely there by three members.

Saxifraga granulata L. (Meadow Saxifrage). Sulham, where it was first reported in 1946 (J. Hodgson).

Chrysoplenium oppositifolium L. (Opposite-leaved Golden Saxifrage). Gallowstree Common. (Mrs. Paul); Sulham Wood (Mr. Douglas).

Salvia pratensis L. (Meadow Sage), distinguished by its handsome spikes of blue flowers, was growing thickly on June 23rd at two separate spots, some 50 yds. apart, at Unhill Bottom, where one specimen was found last year. (Mr. Douglas); Gatehampton, Oxon. (Mrs. Paul)

Senecio integrifolius.(L.) Clairv. (Field Fleawort), found sparingly last year on the Berkshire Downs, has developed into a thriving little colony. (Mr. Douglas).

Hottonia palustris L. (Water Violet). Although Great Lea Pond is gradually filling up, this species is increasing its area and spreading nearer

to the edge; 100 plants were counted on May 20th. A new locality is a small pond between Waltham St. Lawrence and Ruscombe (Mrs. Simmonds). Dr. Watson reports it from one of the Loddon backstreams.

Campanula patula L. (Spreading Campanula). In a gravel pit at Bucklebury, which may well constitute a new record (Miss L.E. Cobb). This plant is very local in the south.

Galium pumilum Murr. (Slender Bedstraw), first reported from Sulham last year, was seen at Gatehampton (The Recorder) .

Pulmonaria (Lungwort). Near Stoke Row (Mr. Douglas). It is not known whether P. longifolia Bor., native in woods and thickets on clay soil and very local, or P. officinalis L., which has long been cultivated in cottage gardens and become naturalised in some parts of the country, is the species concerned.

Solidago virgaurea L (Golden-rod). Yattendon (Miss Cobb); Frilsham (J. Hodgson).

Orchis simia Lam. (Monkey Orchid). Three specimens were seen in full bloom on June 11th near the former habitat, which was ploughed up in 1950 (Dr. Erith, Mrs. Simmonds, the Recorder).

Orchis ustulata L. (Burnt Orchid). On the Downs near Streatley (D.R.M. Stewart, per Dr. Watson).

Ophrys insectifera L. (Fly Orchid). 35 specimens in a small area near Collin's End (Mrs. Simmonds); in a wood at Bix Bottom (Mrs. Paul).

Aceras anthropophorum (L). S.F. Gray. (Man Orchid). On June 17th approximately 18 plants in flower in its old station (a slight increase in numbers since 1953).

Herminium monorchis (L) R. Br. (Musk Orchid). Another of our rare local orchids that was apparently destroyed in 1952 by ploughing, still survives. Mrs Simmonds reports that although the slope had been reploughed, a careful search on June 20th. revealed 5-6 tiny plants in bud and flower. Mrs Paul visiting the area a week or so later discovered more plants above the ploughed slope.

Gymnadenia conopsea (L) R. Br. (Fragrant Orchid). Cholsey Downs (Mr. Douglas); Bix Bottom (Mrs. Simmonds).

Spiranthes spiralis (L) Chevall. (Autumn Lady's Tresses). The previous record was in 1946, and last year this station was destroyed by the plough, so it is encouraging to hear of new ones. Near Kingwood Common, growing plentifully on a lawn, which, owing to prolonged dry weather, had not been mown (Dr.N.B. Eales), at Leighton Park School, within the Borough of Reading,

two plants flowered in September 1951 on an old lawn that had been left unmown and again appeared this year (Mr. J. Ounsted); Peppard (J. Hodgson).

Epipogium aphyllum Sw. Apparently not seen in its famous haunt this year, but Mr. J. E. Lousley, a member of the Botanical Society of the British Isles, saw five flowering plants in another wood in the same district on September 4th. 1953.

Ophioglossum vulgatum L. (Adder's Tongue). Gatehampton and Berin's Hill, both new localities (Mrs. Simmonds).

In 1954, the Botanical Society of the British Isles launched the project of preparing an atlas of distribution maps of British flowering plants and ferns, on the basis of the presence or absence of each species in the 10 - kilometre squares of the National Grid, and is seeking the co-operation of all professional and amateur botanists. Of roughly 3,500 such squares, five are being worked by one or two members of our Society. A considerable part of these areas comes within the ten-mile radius to be covered by our Local Flora, so the Society now has a two-fold aim; to build up a better knowledge of our own most varied local flora, and to help in the collection of data on the distribution of British plants.

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Extracts from the Recorder's Report for Entomology for 1954-55

By B.R. Baker

Notes and records have been received from several of our members and from other entomologists in the district. My thanks are due to Miss Cobb, Miss Nelmes and Mrs. Simmonds, also to Air-Marshall Sir Robert Saundby, Messrs H.L. Dolton and P.W. Hanney, and Master John Richards, and to Mr.W.A. Smallcombe for again allowing full use of the Museum records.

The weather for this past season was vastly different from that of 1954 and insects, especially immigrants, were present in far greater numbers. November and December were mainly mild, but January and February brought heavy snow and severe frost, though in February, the normal amount of sunshine was exceeded in nearly all parts of the British Isles. The spring was cold, and on May 18th there were considerable snowfalls, which were the heaviest experienced in May for 12 years. June continued cool, and then followed a marvellous summer spell, which began early in July and continued for many weeks.

Order Lepidoptera (Butterflies and Moths).

John Richards found Lysandra bellargus (Adonis Blue) again this year at Hardwick and was particularly pleased to take a female of the form obsoleta. He also found the white variety of Colias croceus (Clouded Yellow) known as helice, and records in great numbers, Plusia gamma (Silver Y), Lycaena phlaeas (Small Copper) still in flight on October 6th, and the late occurrence of Coenonympha pamphilus (Small Heath). Sir Robert Saundby comments on the increased numbers of Tethea duplaris (Least Satin Moth) at Burghclere this year. He also took three specimens of Amathes ditrapezium (Triple Spotted Clay). A strange Plusia, in perfect condition, which came to his light trap on November 5th proved to be P. acuta, the second British specimen ever taken; a third occurred in Surrey on the same night. He states that it was late in the year for the arrival of an immigrant, but suggests that his moth might be the British-bred offspring of an August or September immigrant. Miss Nelmes records an extraordinary number of larvae of Dasychira pudibunda (Pale Tussock), Lophopteryx capucina (Coxcomb Prominent) and Apatele rumicis (Knotgrass Moth) seen by members of our Society on the occasion of the Fungus Foray. They were practically all seen on the trunks of beech trees, and the larvae of D. pudibunda appear to have been going up the trunks, whereas the other species were coming down. The larvae of L. capucina and A. rumicis pupate in the soil and were presumably coming down for this purpose. The larvae of D. pudibunda spin cocoons among leaves, and they may have been leaving another food plant and going up the beech trunks to spin somewhere in the twigs. A most interesting record came from Mr. A.E. Deacon of Tilehurst, who was fortunate enough to observe a Nymphalis antiopa (Camberwell Beauty) on a Buddleia in his garden for over two hours at the end of August.

In last year's report, I referred to Ptilophora plumiger (Plumed Prominent) reported by Mr. T. Harman from the country round Turville and added that we hoped to shine a blue light in the beechwoods to see if we could turn up further specimens. On November 14th, I took a generator up to the beechwoods and was delighted to take two specimens shortly after 6 o'clock on a foggy evening. The following Saturday, I took a further specimen, and when Sir Robert Saundby and I visited the ground shortly afterwards we had high hopes of seeing others.

But the weather had changed, gone was the fog beloved of plumigera and we had clear skies and very low temperatures.

On February 7th, Theria rupicaprararia (Early Moth) was well out at Tilehurst, the males flying in numbers after dusk along the hawthorn hedges and the almost wingless females resting on the bare twigs, but they were not seen again until March 14th. On this date, I saw the first Gonepteryx rhamni (Brimstone) and Honey-bees of the year. On April 11th, the banks of the Pang near the Blue Pool were the haunts of many hibernated Aglais urticae (Small Tortoiseshell) and N. io (Peacock). Pieris rapae (Small White) was well out by now. A portable generator attracted the local Orthosia populeti (Lead-coloured Drab Moth) from Brimpton Mill marsh on April 23rd. Odontosia carmelita (Scarce Prominent) was attracted to light at Oval Pond, Padworth, on April 25th, when several of the attractive Polyploca ridens (Frosted Green) also came to the light. Larvae of the beautiful Polia tinctoria (Silvery Arches) were abundant on the birches at Burghfield on April 28th. They show up very clearly in the rays of a lamp after dark when the buds are just bursting; later in the month, the mass of new foliage makes searching much harder. This summer we have had some wonderful nights at Woolhampton, often commencing operations about 10.30.p.m. and returning with the dawn. The grasshopper warblers lived up to their name and we had them sawing away the whole night through. Notable moths taken were:- Leucania obsoleta (Obscure Wainscot), 1 on June 25th, Xanthorhoe quadrifasciata (Large Twin-spot Carpet), 1 on June 25th, 1 on July 13th; Stilpnotia salicis (White Satin), 2 on July 11th; Chilodes maritima (Silky Wainscot), 1 on July 13th. The beautiful Plusia chryson (Scarce Burnished Brass) was noted on many visits. These excursions to Woolhampton were made at the height of the summer weather and insects abounded; we recorded 96 different species of moth on July 11th and 105 on July 13th.

During August and September, the numbers of "white" butterflies were tremendous everywhere, and A. urticae was very common. Vanessa atalanta (Red Admiral) appeared on the town Buddleia bushes in numbers. Macroglossa stellatarum (Humming Bird Hawkmoth) reached Reading in some numbers and produced an autumn brood that delighted our eyes. On several occasions they were hovering over the petunias at Tilehurst. Moths and butterflies continued in good numbers throughout the autumn. Mrs. Simmonds saw V. atalanta (one) as late as November 1st, and on November 5th the Tilehurst light-trap was still bringing in fresh specimens of the immigrant Plusia gamma which this year invaded the country in thousands.

Order Trichoptera (Caddis-flies)

The Blue Pool produced this year the first specimen of Drusus annulatus, which is new to our local list. By April 17th, the Kennet at Woolhampton was alive with newly emerged Grannom or Greentails, as they are often called by reason of the habit of the female of flying above the water with a conspicuous jelly-mass of green eggs on her "tail".

At Coleman's Moor on May 27th I took several of the prettily speckled caddis, Holocentropus stagnalis, but the credit for turning up this very local little insect belongs to Mr. Hanney, who brought in a single specimen to the

Museum a fortnight before my visit. The British Museum has no examples of this caddis from Berkshire and we have promised them some specimens. During August, Miss Townend brought me several specimens of Athripsodes dissimilis attracted to light at Grassmere Avenue, Tilehurst. This caddis, which has extremely long antennae, usually occurs singly. The warm weather at this time of year must have favoured them and the flight must have been considerable, as the Grassmere Avenue specimens presumably originated from the Thames. On October 10th, a single Limnephilus affinis came to the Tilehurst light; this is a new Berkshire record.

Order Plecoptera (Stone-flies)

Both Isoperla grammatica and Perlodes mortoni were abundant on the Kennet at Woolhampton on May 29th, a good emergence of the insects being evidenced by the large number of empty nymphal skins visible all along the river banks.

Order Ephemeroptera (May-flies)

On the same date, the pretty yellow may-fly, Heptagenia sulphurea (Yellow Hawk), was flying among clouds of the commoner Ephemerids.

Order Hemiptera. Sub.Order Heteroptera (Plant Bugs)

During the Society's excursion to Pamber Forest on July 20th, Mr. Hanney recorded several examples of Pentatoma rufipes (Forest Bug) beaten from birch. On September 7th, he found Acanthosoma haemorrhoidale (Hawthorn Bug) commonly at Theale; nymphs taken at this date became adult two days later. He

discovered these Hawthorn Bugs by smell.

Order Hymenoptera (Bees, Ants and Wasps)

A queen Vespula sylvestris (Tree Wasp) freshly out of hibernation was found by Mrs.H.G. Baker at Sulham on March 27th, and the first V. germanica (German Wasp) of the year was observed on April 1st. On May 8th we discovered a honey-bee's nest in full production at Sulham. The bees had taken over a green woodpecker's hole in an oak tree that had been felled and was lying across the Sul stream. Miss L.E. Cobb records spined galls caused by the Cynipid wasp, Rhodites nervosus, on rose at Ashridge Woods. These spiny pea galls, as they are called, are easily recognised by their sharp-pointed spikes.

Order Orthoptera (Grasshoppers and Crickets)

In Sulham Woods on May 15th, my son and I found numbers of the tiny ground hopper Tetrix vittata, active in the afternoon sunshine. On the Society's excursion to Pamber Forest on July 20th, the heathland was alive with Orthoptera and members found specimens of Metrioptera brachyptera (Half-margined Bush Cricket) and also Myrmeleotettix maculatus (Small Club-horned Grasshopper). Omocestus ventralis (Wood Grasshopper) was found by Miss Stone in the forest. At Tilehurst, Pholidoptera griseoptera (Autumn Bush Cricket) strummed away loudly from August until, at least, late October. Patient searching by torch-light revealed them in the thick vegetation by the roadside. Trying to track them down by their song can be a good test of one's patience; the sound seems to come first from one part of the bush and then from another, and when one eventually locates the insect, it drops down into the stinging nettles as one tries to reach for it. The last night on which I heard this Bush Cricket strumming by the police box at Armour cross-roads was that of October 24th; it was silent on November 7th, although the night was quite warm.

Hidden Swallow-Holes near Emmer Green

being the report of the Recorder of Geology, 1954-55

By Professor H.L. Hawkins, D.Sc., F.R.S., F.G.S

The section until recently exposed in the yard of the Emmer Green Brickworks showed several features of interest and mystery. The pit is now almost degraded, but it is still possible to see the bottom-bed of the Reading Beds, replete with oysters and half-worn, green-coated flints, resting horizontally on the planed off surface of the chalk, into which green sand has been let down in innumerable borings to a depth of about two feet from the plane of contact. But in the higher parts of the pit this normal and horizontal relation is, or was, seen to be replaced by steeply dipping layers, so that the whole bulk of the Reading Beds (about 75 feet thick and dipping eastwards at about 30 degrees) came into view, to be followed by the shell-bed at the base of the London Clay and a considerable thickness of that formation.

The anomalous appearance of the London Clay, which would have been expected to have occurred some 40 feet above the highest point of the hill-top, led the Geological Survey to postulate a fault, indeed a whole triangle of faults, dropping a wedge-like mass of the Eocene down below its normal level. That some faults exist in the district is certain; but it is equally certain that the one indicated as passing through the brick-pit is non-existent. But something out of the ordinary has happened there.

When it was suggested that a rather heavy building should be erected on a site about 100 yards to the northwest of the brick-pits, realization of the unusual condition of the subsoil in the neighbourhood made necessary an intensive exploration to ensure that the site chosen would provide a sound foundation. If all were satisfactory, the Chalk would be found at a depth of about 25 feet from the surface, with undisturbed Reading Beds lying between it and the overburden of sandy gravel that caps the hill.

Five borings were planned, one in the centre of the site, and four on the circumference of a circle rather wider than the proposed foundations. Superficially the site seemed ideal. Boring no.1, at the south-east "corner", proved most promising, for beneath $10\frac{1}{2}$ feet of sandy gravel firm Reading Beds lay in normal posture to a depth of $25\frac{3}{4}$ feet, at which depth the Chalk was found. Boring no.2, at the north-east "corner" of the site, started in much the same way as no.1, except that the subsoil was more of a loam than gravel. But even when it had been taken to a depth of 35 feet, no sign of either Reading Beds or Chalk was forthcoming, the soft silty loam persisting almost without change all the way down. Boring no.5, at the centre of the now discredited site, failed to penetrate the soft loam at a depth of 30 feet, and made it clear that there was no point in proceeding with nos. 3 and 4, for no firm foundation was available within the circle on which they were planned.

In hopes of better conditions further west, boring no.6 was made about 90 feet westward from no.1. It was a complete success, reaching the Chalk at $24\frac{1}{2}$ feet down, a figure conforming exactly with expectation in view of the gentle south-easterly dip of the strata. So no. 7 was made half-way between no.6 and the disappointing no. 5. The superficial gravel and sand proved to be nearly twice as thick as expected, but hopes rose when recognizable Reading Beds were found at 19 feet down. These hopes faded when, at 26 feet

down, nothing suggestive of the "bottom-bed" appeared. They rose again when this distinctive layer came up from 29 feet, only to sink once more when brightly mottled clay was found beneath it. However the Chalk was reached at $36\frac{1}{2}$ feet down, although the beds above it were obviously disarranged and weakened.

Keeping well to the west of no. 7, borings 8 to 13, grouped around a circle of which no. 6 was nearly in the centre, all proved fully satisfactory. Nos. 2 and 5 are evidently over a concealed swallow-hole in the Chalk, and no. 7 is presumably over part of its edge. This swallow-hole (which may well be over 100 feet deep) must be of very considerable antiquity, for there is no feature on the surface to hint at its existence. Only last year a part of the eastern hedgerow bounding the field explored sank suddenly to a depth of about 10 feet, more or less at the same time that a spectacular subsidence occurred at Binfield Heath about a mile further to the east. (A similar subsidence occurred at Horn Castle near the Bath Road last winter). The whole area around the edge of the Emmer Green outlier of Eocene beds is pitted with swallets, old and new, and doubtless there are many more hidden like the one discovered by the trial borings.

It seems that the strange conditions occurring in the Emmer Green brickworks represent one side of a similar, but much larger, subsidence, and one that took place so long ago that at the time of its collapse the hill was at least 60 feet higher than it is now, and capped by London Clay. Indeed, the date of its development must be prior to the formation of the plateau gravel, which rests on Reading Beds and London Clay alike. This huge swallow-hole is therefore probably pre-glacial, and may have occurred in times as remote as the Pliocene, or even the Miocene, period.

Extracts from the Recorder's Report for Ornithology for 1954-55

By E.V. Watson, B.Sc., Ph.D.

(Period covered: October 31st 1954-October 31st 1955)

1. Winter Gulls Black-headed Gulls were slow to arrive this winter at their usual haunts at Caversham and by Huntley & Palmers. They were proved by Mr.C.E. Bignal to be roosting at Sonning Eye in January 1955. Lesser Black-backed Gulls were frequent at Sonning. The locally much rarer Greater Black-backed Gull was seen by Mr. Bignal at Sonning Eye on January 15th and 29th. Mr.J.L. Fox's record of a Kittiwake at Wokingham on December 10th 1954 was of exceptional interest.

2. Winter Duck The list of species seen in the winter under review was quite formidable: Mallard, Teal, Pochard, Tufted Duck, Wigeon, Shoveler, Golden Eye, Smew, Gadwall and Red-breasted Merganser. This last was seen by Mr.C.E. Douglas at Burghfield on February 26th and 27th. Mr. Bignal recorded surprisingly big numbers of some species at Sonning and at Bulmershe in the early months of the year, e.g. 332 Wigeon at Bulmershe on February 13th, and 224 of this species at Sonning Eye on February 20th, when Bulmershe was frozen.

3. Winter Finches and other Winter Movement . Mr. Fox found Bearwood a sure place for Redpolls during the winter, and, in smaller numbers, for Siskins. Observations on nomadic winter flocks of commoner finch species appeared to be few; they would repay study. Fieldfares were last seen at Sonning on April 3rd 1955 (Mr. Bignal). The Recorder's first observation of the species this autumn was on October 23rd, over Highmoor Road, Caversham. There were about 35 Golden Plover at Sonning Eye on January 23rd (Mr. Bignal).

4. Spring Arrival of Migrants. The Recorder had no dates of his own to offer and was thus grateful to those who had made available the following records: March 27th, Song Martin; Chiffchaff, an early Swallow; April 1st, Willow Warbler, Wheatear; April 10th, Nightingale; April 13th, Yellow Wagtail; April 16th, House Martin, Blackcap (late), Whitethroat, Sedge Warbler, Common Sandpiper; April 21st, Cuckoo; April 24th, Garden Warbler (an early date, Mr. Bignal); April 25th, Swift; April 30th, Turtle Dove. East winds and cool days prevailed throughout most of April. It is stressed that dates of main arrival movements are of greater interest than those of occasional, exceptionally early individuals.

5. Spring Passage of Waders and Terns. 17 Curlews were seen by Mr. Bignal on April 13th, flying west over Woodley. One was seen by Dr. C.C. Balch near Sonning on April 14th. Mr. Bignal also recorded two Green Sandpipers at Woodley on March 27th and one between April 10th and April 30th. Mr. Douglas recorded one Sanderling and one Dunlin at Burghfield gravel pit on May 7th. Three Wood Sandpipers seen on May 30th at Aldermaston gravel pit by Messrs. H. Randolph and K. White complete the list of interesting species of waders recorded on spring passage in 1955. The passage of Black Tern would seem largely to have passed us by. One was noted at Theale new pit on May 29th. A single Sandwich Tern (April 5th, Burghfield gravel pit) is of outstanding interest. One Little Tern at Burghfield on May 8th (Messrs Simmons and

Sutton) is less unusual.

6. Breeding Records. Mr. Douglas informs the Recorder that the breeding of Common Sandpiper at Aldermaston constitutes a first record for the county. Mr. K.E.L. Simmons reports that two pairs of Red-backed Shrike reared young at Norcot sand-pit. The Caversham Wrynecks nested successfully in a nesting box, as in previous years. Whinchats, apparently breeding, were seen on the Downs between East Ilsley and Streatley. Little Ringed Plover reared young at a local gravel pit.

7. Departure of regular Summer Visitors. This is always an elusive process and what few precise dates are available we owe to Mr. Bignal. They are: Swift, August 29th; Sedge Warbler, September 11th; Whitethroat, Willow Warbler and Common Sandpiper, September 24th; Chiffchaff, Sand Martin and Yellow Wagtail, September 25th.

8. Autumn Passage of Waders and Terns. The Recorder saw two Green Sandpipers at Englefield on October 16th. This species generally seems to be with us year after year in the same haunts, from late summer onwards far into the winter. This year, Mr. Douglas recorded them at Aldermaston on July 19th.

9. Various Passage Movements; Specific Rarities. Among interesting, but less spectacular visitors may be mentioned: Water Rail, seen by Mr. Fox at Bearwood and by Mr. Bignal at Sonning Eye; a male Redstart seen by Mr. Bignal at Woodley gravel pit on April 8th; and a female Stonechat at Sonning Eye on January 15th. Records of this species, much diminished in numbers in recent years, are always welcome. A Corncrake at Beech Hill (April 30th, Mr. Fox) and a Buzzard over Northcourt Avenue, Reading (May 15th, Mr. P.B. Gilland) are worth recording. The year has also been remarkable for the appearance in the district of a number of special rarities. Thus, a Great Northern Diver stayed for some days at Longmoor at Christmas time, 1954; a Bewick's Swan remained at Burghfield gravel pit between Christmas 1954 and late February 1955; a Puffin was picked up at Sindlesham on October 6th and lived for a few days. Mr. B.R. Baker reports a male Pied Flycatcher from Sheffield Bottom. This is a rarity in this district although locally plentiful as a nesting species elsewhere in Britain. Mr. Bignal's record of four female Common Scoters at Sonning Eye on August 14th is remarkable indeed. Finally, Mr. Stanley Day writes from Harpsden Wood End, Henley, to say that a Hoopoe visited his lawn on April 18th and 19th 1955. His description leaves no doubt as to its identification.

It would be churlish to conclude without due acknowledgement of the debt we owe to Mr. Douglas and others who have made available much of the information contained in this report. The Reading Ornithological Club Report for 1954 has also been a source of valuable data.

B A D G E R S

by B.J. Thompson

The European Badger (Meles meles L.) is the only species of Badger inhabiting Britain, and has been here for at least the last 250,000 years *. The adult has very fixed habits, in that it uses the same tracks and feeding grounds and has regular dung pits in the vicinity of its sett. The feeding grounds are usually within a mile or so of the sett; the food consists of young mammals, numerous insects, land molluscs, earthworms and a good proportion of vegetable material, which is usually in the form of roots, tubers, acorns, fallen fruit, berries and grass. Thus the badger can be acclaimed as a truly omnivorous mammal.

Badgers have been known to dig their setts in very different kinds of country and soils but the most common habitat is sloping woodland in the vicinity of water. Since they are nocturnal in their habits, have a keen sense of smell, are very sensitive to movement and have an acute sense of hearing, they are not very easy animals to study in detail. These disadvantages may be overcome by the observer if he positions himself suitably, for the badger is not looking for trouble and usually approaches noisily along the track. His black and white striped head acts as a warning colouration to other small animals to get out of the way. The badger can also make several vocal noises. A frightening, piercing, scream is sometimes made, presumably as a long-distance call note; the male badger or boar, is able to emit a "purring" noise which is probably of sexual significance when calling to the female or sow; and the young cubs make several yelping noises, like young puppies, when they are playing.

At about the end of February the cubs are born, usually two or three to a family, and they remain below ground until the latter part of April. On emerging from the sett the family is usually led by the boar who makes sure that all is safe. Having satisfied himself, he and the rest of the family sit down and have a good scratch. The badger is a very clean animal and is not likely to have many ectoparasites, so the purpose of this scratching is probably to alleviate the irritation produced by a dry skin. The cubs are then looked over by the sow and play commences. This play is often educational in origin, bringing into function several neuro-muscular mechanisms which are of vital importance in later life, i.e. the escape mechanism, the burrowing mechanism.

The young badgers probably leave their parents in October, when there is great activity in the colony with dead, dry, vegetation being dragged in for bedding and new setts being excavated for the newly paired cubs. There is a delayed gestation period for, although copulation occurs in July, the blastocyst does not become embedded in the uterine wall until the following December. Development is then very rapid and the cubs are usually born in the latter half of February.

I hope that this broad picture of the life and habits of the badger may have stimulated some local interest. There are several badger colonies in the neighbourhood of Reading, notably along the Warren below Chiltern Court, Caversham, and in Mount Skyver Wood to the west of Tilehurst, and local gamekeepers probably know of further active colonies.

* Ref. E.G. Neal. "The Badger". New Naturalist Series.

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Graviperception in Fronds of *Asplenium Bulbiferum*.

by F.M.C. Waight. F.L.S.

Young and growing parts of plants normally re-act to the stimulus of gravity by the plumule of a seedling growing upwards and the radicle downwards. If the seedling is placed in a horizontal position it will be found that the growing tip of the root will curve downwards and the growing shoot curve upwards. The growing parts thus re-adjust themselves in relation to gravity. Such movements are called the movements of geotropism. Roots which grow downward are called positively geotropic, shoots which grow upwards negatively geotropic.

Until 1922 most of the work on geotropism was confined to Angiosperms until Dr. T.L. Prankerd showed that the fronds of ferns were negatively geotropic. It was then that detailed work was carried out on the fern *Asplenium bulbiferum*. I attempted to measure the intensity of the response to a geotropic stimulus by ascertaining the presentation time at different stages of development of the fern. If a fern is laid horizontal and then replaced upright a movement will result which can be measured. The shortest time of horizontality necessary to secure the slightest movement of the frond when it is replaced upright is called the presentation time, and the latent time is the period from the beginning of horizontality to the moment when the movement is just visible.

The ferns were grown in a greenhouse and as far as possible the temperature and the humidity were kept constant: temperature never above 21 degrees C. or below 19 degrees C, humidity 80-90 per cent. For stimulation the fronds were placed horizontally on their sides and adaxially to the incident light. In order to see if any movement had occurred, the outline of the frond was traced on glass, almost in contact with it. At the end of the period the plant was either rotated on the klinostat or the plant so placed that the frond was quite vertical. A klinostat is a piece of apparatus used to revolve a plant in a horizontal position so that the stimulus of gravity is equalised. As a result of many experiments it was found that difference between the two methods was inappreciable.

When upwards of four hundred experiments had been carried out in this way an approximate idea was gained of the presentation time at the various stages in the development of the frond.

For the sake of distinguishing between the different stages of development of the frond, the following terms were given:- Infant Stage, when the leaflets are in the apical coil, which was sub-divided into Early Infant, fronds 0.8 - 3.0 cms; Middle Infant, fronds 3.0 - 5.5 cm; Late Infant, fronds over 5.5 cm. with no leaflets unfolded; and Adolescent Stage, 1, 2, 3, 4, etc., according to the number of pairs of leaflets unfolded from the apical coil.

After the approximate idea had been gained of the Presentation Time at the various stages mentioned above, critical experiments were made for each stage. The angle recorded was in every case the maximum reached and the results of these experiments were checked by those where no curvature took

place with the same or somewhat lower periods of stimulation.

Column I in the tables shows that considerable difference in the length of the frond does not affect the presentation time and latent time. It has been found that these periods depend on the stage and only indirectly on the length of the frond.

After about eight pairs of leaflets are unfolded the presentation time is much more difficult to measure, owing to the fact that nutation and epinasty are at their maximum.

The following tables show examples of experiments at various stages in the frond's development.

Temperature 20 degrees C (approx); humidity 85% (approx).
 P.T. - presentation time.
 L.T. - latent time

<u>Length of frond</u> <u>in cm.</u>	<u>Period of stimulation</u> <u>in hours</u>	<u>Angle of</u> <u>curvature</u>	<u>Latent time</u> <u>in hours</u>
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Stage: Early Infant (apical coil just above soil level)

1.5	$8\frac{1}{2}$	4	16
0.8	8	5	16
1.6	$8\frac{1}{2}$	-	-
1.2	$7\frac{3}{4}$	-	-

P.T. - 8 hours

L.T. - 16 hours

Stage: Early Infant (apical coil about a centimetre above soil)

1.5	4	10	10
1.5	4	5	10
1.5	4	4	10
2.3	4	-	-
2.7	$3\frac{1}{2}$	-	-
2.6	3	-	-

P.T. - 4 hours

L.T. - 10 hours

Stage: Middle Infant

5.2	3	11	$7\frac{1}{2}$
5.0	3	10	8
3.0	3	7	9
3.4	3	5	9
3.8	3	5	$7\frac{1}{2}$
3.0	3	-	-
3.0	3	-	-

P.T. - 3 hours

L.T. - 8 hours

Length of frond Period of stimulation Angle of Latent time
in cm in hours curvature in hours

	Stage: Late Infant		
6.5	2	15	5½
6.5	2	10	6
7.2	2	10	5
8.5	2	10	6
6.5	2	5	7
7.0	2	5	7
5.5	2	-	-
	P.T. - 2 hours	L.T. - 6 hours	

	Stage Adolescent I		
7.5	1½	10	6½
6.5	1½	8	5
7.5	1½	7	5½
5.0	1½	-	-
7.7	1½	-	-
	P.T. - 1½ hours	L.T. - 5½ hours	

	Stage Adolescent II		
8.5	1	13	5
11.2	1	10	5
8.0	1	9	6½
8.0	1	7	5½
	P.T. - 1 hour	L.T. - 5½ hours	

Stage Adolescent 3 and 4 (number of pairs of leaflets unfolded placed in brackets after length in this and the next table)

12.0(4)	10	5
7.0(3)	10	5½
10.0(3)	8	5½
8.5(3)	7	5½
10.6(3)	5	6
9.5(4)	-	-
11.5(4)	-	-
	P.T. - ¾ hour	L.T. - 5½ hours

	Stage Adolescent 5, 6, and 7		
16.0(7)	12	5½	
14.5(5)	7	5	
21.5(5)	7	4½	
13.2(6)	8	5½	
24.5(7)	-	-	
17.7(5)	-	-	
12.0(6)	-	-	
	P.T. - ½ hour	L.T. - 5 hours	

<u>Length of frond</u> <u>in cm</u>	<u>Period of stimulation</u> <u>in hours</u>	<u>angle of</u> <u>curvature</u>	<u>Latent time</u> <u>in hours</u>
	Stage: Adolescent 8		
20.2	2	10	5
13.0	1	5	5½
13.7	five sixths	-	-
11.7	$\frac{3}{4}$	-	-
20.0	$\frac{3}{4}$	-	-
	P.T. - 1 hour		L.T. - 5½ hours
	Stage: $\frac{2}{3}$ (approx)		
18.0	3	10	6
15.7	3	10	7
21.2	$2\frac{1}{2}$	5	5½
18.5	$2\frac{1}{2}$	5	5½
19.5	$2\frac{1}{2}$	-	-
18.3	$2\frac{1}{4}$	-	-
14.0	2	-	-
28.5	2	-	-
	P.T. - 2½ hours		L.T. - 5¾ hours
	Stage: Adolescent $\frac{3}{4}$ (approx)		
17.5	$3\frac{3}{4}$	10	6
16.2	$3\frac{1}{2}$	7	6½
17.0	$3\frac{1}{2}$	7	6½
16.5	3	-	-
18.7	$2\frac{1}{2}$	-	-
19.5	$2\frac{1}{2}$	-	-
	P.T. - 3½ hours		L.T. - 6¼ hours
	Stage: Adolescent $\frac{4}{5}$ (approx)		
30.0	$4\frac{1}{2}$	5	7
	P.T. - 4½ hours		L.T. - 7 hours
	Stage: Adolescent $\frac{7}{8}$ (approx)		
13.5	6	5	8
32.0	5½	-	-
	P.T. - 6 hours		L.T. - 8 hours



From the above tables it will be seen that the presentation time is 8 hours at a very early stage in the life of a frond, and decreases during its development until it reaches a minimum of $\frac{1}{2}$ hour when the fifth to the seventh pairs of leaflets are unfolding. It then rises again until all response to gravity ceases, when only the rudiments of the last two or three pairs of leaflets remain in the apical coil.

The latent time, like the presentation time, is affected by the stage of the development of the frond, but to not nearly so great an extent, since the range is only 16 - 5 hours as against 8 hours - $\frac{1}{2}$ hour,

