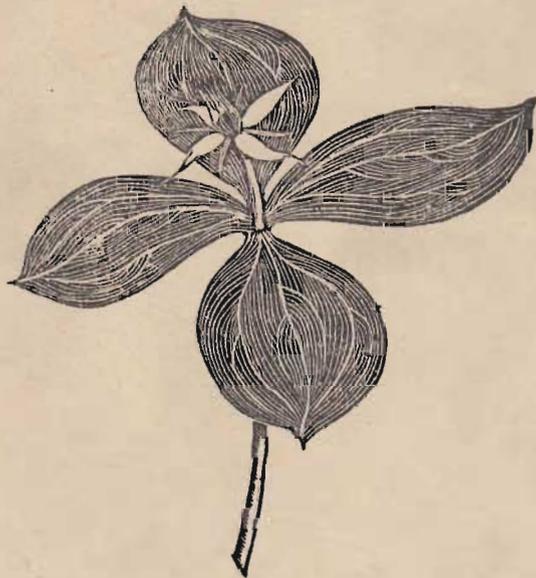


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THE READING NATURALIST

No. 19 for the year 1965-66

The Journal of
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Meetings and Excursions, 1965-66

The first meeting of the winter season was the Annual General Meeting, at which Mr. A. Price gave his Presidential Address, on "The Recurrence of Albino Frog Spawn in Reading" (44). One evening was devoted to members' exhibits and communications (39), one to a brains trust (26) and one to the Berkshire, Buckinghamshire and Oxfordshire Naturalists' Trust film and talks about the Trust's work (50). The lectures given at the remaining meetings were "Nature Photography", by D. W. Irvin (40); "Meteorites", by Dr. M. Hey (34), "Birds in an Essex Wood", by Mrs. R. Upton (38); "Why Insects are Pests", by Dr. H. F. van Emden (24); "The Natural History of the Badger", by J. Sankey (86); "Moths, Birds and Predation", by J. Cadbury (37), and "Mountain Flowers", by Miss M. G. Hodgman (57).

Winter walks and outings were held on 6th November, Goring Heath to Pangbourne; 4th December, Thames-side from Scours Lane to Cow Lane; 1st January, Museum of English Rural Life; 5th February, Ashley Hill, and 5th March, Mortimer (for mosses).

The summer field meetings were as follows: 2nd April, Burghfield; 16th April, Whitchurch; 30th April, Greathouse Wood, Bradfield; 14th May, Medmenham to Hambleden; 28th May, Ashley Hill; 11th June, Goring Heath to Pangbourne; 25th June, Pamber Forest; 29th June, Dunsden; 9th July, Lower Assenden; 13th July, Little John's Farm (for water life); 23rd July, Hazeley Heath; 27th July, Nunhide Lane; 6th August, Swallowfield; 20th August, Woolhampton; 3rd September, Chobham Common (marsh gentian); 24th September, Aldermaston Soke; 1st October, Southlake, Earley; 15th October, fungus foray at Kingwood Common.

The annual Young Naturalists' Evening was held on 21st March in the Large Town Hall. The audience of 500 Reading school children heard Dr. F. E. Hora, Dr. Max Hey, Mr. Robert Gillmor and Mr. W. A. Smallcombe answer questions selected from the 775 submitted and presented to them by the Questionmaster Mr. J. F. Newman. Winners of the eight prizes, given by the Natural History Society, were: Wendy Barlow, Geoffrey Field Junior School (9 yrs.), Julia Bartlett, Alfred Sutton Secondary Girls' School (11 yrs.), Helen Berry, Grovelands Primary School (10 yrs.), Timothy Cole, Manor Junior School (10 yrs.), Colin Deacon, St. Michael's Primary School (11 yrs.), John Forys, Redlands Primary School (10 yrs.), Lynette Ridgley, Cintra Secondary School, (14 yrs.), Beatrice Tansey, St. Joseph's Convent Preparatory School (10 yrs.). They received their prizes from the Right Worshipful the Mayor of Reading, Alderman Mrs. A. J. Burrows, who then joined the children to watch the film "Wild Highlands".

THE RECURRENCE OF SPAWN OF ALBINO FROGS (RANA TEMPORARIA L.)
IN READING IN 1965-66

Based on the Presidential Addresses to
the Reading Natural History Society for 1965 and 1966

By Arthur Price

White frog spawn was found on 24th March 1965 in the garden of Mr. and Mrs. Masterman, 11, Buxton Avenue, Caversham, Reading, where a light coloured frog had been seen in the gardens a few days previously. Some of this spawn was taken to many schools in Reading by the children of Mr. and Mrs. Alderman, 19, Clifton Park Road, Caversham, and I was given on 2nd April about fifty newly hatched tadpoles by Mrs. B. Newman from those which hatched in the animal room at Kendrick Girls' School.

The word 'recurrence' is used in the title because of the work done by Mr. W. A. Smallcombe. His paper on 'Albinism in Rana temporaria' should be read. The word 'albino' means that the animal in question has a congenital deficiency of pigment in the skin, hair and eyes so that the skin is white and the eyes pink.

It seems likely that the 1965/6 albino spawn is closely linked genetically with the 1938 albino spawn. Tadpoles which hatched from the 1938 spawn were given to the late Mr. C. Runge, a dedicated naturalist, who possibly released some of the resulting frogs in his garden, which was not very far from Buxton Avenue.

The 1965 albino spawn proved to be fertile and hatched on 1st April. The newly hatched tadpoles were white with grey eyes. The grey colour of the eyes and the subsequent, progressive pigmentation of the tadpoles and frogs can be explained by the fact that the frogs in question have a recessive gene for albinism (Smallcombe 1949).

I placed my batch of tadpoles in a glass laboratory tank 7" x 5" x 5" on a white background. Small tanks facilitate close observation. In the early stages, even after the external gills disappeared, the tadpoles remained at the bottom of the tank. When artificially stimulated they swam, but in a very sluggish manner.

They fed on filamentous algae but at first seemed to prefer detritus. By 6th April, they were swimming freely and feeding

readily on Canadian Pondweed (Elodea canadensis Michx.). The eyes had by this time darkened and pigment had begun to pepper the dorso-lateral region of the body. On 9th April the tadpoles swam to the surface, but not for the purpose of respiration.

On 11th April, thirty-six tadpoles remained alive and three degrees of pigmentation could be distinguished. One specimen was quite dark, the majority were peppered with pigment in the region of the peritoneum and two were very light in colour with little or no pigment.

On 4th April some fresh Canadian Pondweed was placed in the tank and shortly afterwards a newly hatched, predatory water bug, Ilyocoris cimicoides L., was removed from the tank before it had a chance to attack the small tadpoles. The bug had evidently been introduced with the pond weed as an egg.

Owing to their increase in size, the tadpoles were divided into two lots on 15th April. Nineteen dark specimens were placed in one tank and the fifteen lighter ones in another. It was noticeable that the tadpoles' tails were asymmetrical.

On 18th April two tadpoles were seen feeding on the carcass of a dead one. As a result of this observation, some small pieces of meat were placed in both tanks. Some of this meat was eaten by the tadpoles.

Tadpoles which had hatched from normal, black-centred spawn were kept as controls in a third tank, also on a white background. As a result, they became very light on the fore-parts and could only be told from the albino tadpoles with difficulty.

Periodically the water in all the tanks was changed. Water was run from the tap and left to stand for about twenty-four hours to allow the chlorine to pass out of it. The tadpoles were transferred from one tank to the other in a table spoon.

Meat was now being added regularly in the form of bacon rind, luncheon meat, liver and, later, chopped worms, which proved to be very acceptable.

By 11th May, the tadpoles began to come to the surface of the water to take in gulps of air. The normal ones seemed to come to the surface less often than the albinos.

Three first-instar larvae of the Screech Beetle (Hygrobia hermanni F.) were removed from one tank on 17th May. Again the eggs must have been introduced with the waterweed placed in the

tank for food and oxygenation. At this stage the tadpoles were well developed and the dorso-lateral region was fairly heavily pigmented. The fore-parts, however, were still transparent and the details of the internal anatomy could be distinguished. By 28th May, some tadpoles had developed back legs and a reddish tinge could be seen in the region of the gills due to the presence of haemoglobin in the blood. The black pigment was densest in the region of the peritoneum.

On 1st June some tadpoles were seen with exaggerated kinks in their tails. It had been stated earlier by Smallcombe that this had the effect of distorting the urostyle in some adult frogs. Drinks of air were now taken much more frequently by all the tadpoles.

At this stage, when not one of my tadpoles had metamorphosed, it was reported from Caversham Primary School that four small frogs had been released in the Thames. As far as could be ascertained, these tadpoles had not been given meat as food; this seems to suggest that cannibalism might be a superior method of rearing frogs.

By 7th June, my tadpoles were developing back legs and the elbows of the front legs showed very clearly. By 8th June, the front legs had sprouted and the frogs as they metamorphosed were placed in an earthenware laboratory tank 10½" in diameter and 4" deep containing turf, a flat piece of marble as a rock and a petri dish as a pond. From the time the frogs acquired four legs to the time that the tail was reabsorbed, no food was taken.

All frogs had metamorphosed by 15th July and they were divided into two groups in 10" earthenware tanks. The seven large frogs comprised one group, so that the smaller ones could have sufficient food. A larger, glass laboratory tank, 16" x 11" x 11", was obtained on 30th July and the nine larger frogs were placed in it. This tank had the floor covered with turf, and a pond in the form of a petri dish in one corner to keep the tank humid and to allow the frogs to immerse themselves; a 6" square tile was used as a feeding place. The tank was covered with a piece of glass containing a 4" round hole through which insects could be pushed without losing the food already in the tank. The five smaller, less well nourished frogs, were kept in one of the 10" laboratory tanks so that they would be able to obtain sufficient food. An attempt was made at this stage to sex the frogs, but no external differences were apparent.

Every year in schools, thousands of frogs approach metamorphosis but few survive due to a lack of suitable food and

the lack of provision of suitable vivaria. I felt that aphids would constitute a suitable diet for the newly metamorphosed frogs and found that, in fact, they were readily eaten by the frogs when their tails had been reabsorbed. Aphids, Microlophium evansi (Theobald), from Stinging Nettle (Urtica dioica L.) were collected by tapping the heads of nettle plants into a petri dish. During wet weather it was found more convenient to collect the aphid, Drepanosiphum platanoidis (Schrank), from the leaves of Sycamore (Acer platanoides L.). As the frogs became larger and ate more, it was found more convenient to tap the nettles into a white enamel tray and then to tip the contents into a petri dish. The few small spiders and Heteroptera taken in this way were also eaten by the frogs.

By 7th August the frogs were larger and consequently hungrier, so an alternative source of food had to be found. The Capsid bug Megalocoleus molliculus (Fall.) was found in numbers on Tansy (Chrysanthemum vulgare (L.)). It was supplemented by another Capsid bug, Stenodema laevigatum (L.), which was beaten from grass.

Later in August, spiders became the main source of food. They were beaten from low lying vegetation on to a white enamel tray and sucked up with a pooter. Later a beating tray was used. The size of spider eaten by the frogs increased as the frogs grew. At first the spider Theridion ovatum Clerck predominated, but at a later stage spiders as large as Meta segmentata Clerck. were eaten, and they also ate Xysticus cristatus Clerck., Linyphia triangularis Clerck., and Tibellus oblongus Walckenaer. The frogs in their second year took spiders as large as Araneus diadematus Clerck., even when swollen with eggs in the autumn.

One species of centipede, Geophilus longicornis Leach was readily taken and so were green caterpillars from nettle, but sawfly caterpillars were immediately rejected. In September some Nettle Ground Bugs (Heterogaster urticae (F.)) were used as food. This was a most convenient bug to collect, as it congregates in large numbers on the heads of nettles.

In late September, small earthworms were accepted but the speed with which the worms disappeared into the turf limited the number eaten. Although few maggots bought as fishing bait were taken, the blow-flies emerging from the pupae were not so readily eaten.

Four methods of feeding were observed:

- A. The frog's tongue was flipped out and the prey was carried back to the mouth.
- B. When the prey was a little further away, the frog swayed its body forward but its feet maintained contact with the ground. Then the tongue operated as before.
- C. The frog leaped at its prey, sometimes rolling over after catching the food it was pursuing.
- D. When attempting to capture a worm which had surfaced after burrowing in the turf, the frog tumbled over backwards immediately after seizing the worm to prevent it from anchoring itself.

The sharpness of hearing of a frog was clearly demonstrated on 7th May. A frog was watching a worm which was wriggling in front of it. I dropped another worm immediately behind the frog where it could not be seen. As soon as the worm moved on the white tile, the rubbing of the setae on the tile caused the frog to turn around and eat the second worm.

Sometimes a frog 'set' on an insect prior to attacking it. Other frogs would also 'set' in sympathy, although it was obvious that they could not see that insect.

On 23rd October 1965, fourteen frogs which had developed from the 1965 albino spawn, being between 33 mm. and 41 mm. in length and weighing between 3 and 7 gm., were allowed to hibernate in a glass laboratory tank 15" x 11" x 11" containing loose turfs which had been soaked in water. The tank was placed in an indoor, darkened cellar which was not heated. Some food was placed in the tank. By 31st October all the frogs were found to be suffering from the effects of desiccation. They were all limp and their limbs were outstretched. The frogs, which were capable of movement, moved in a spasmodic manner. All fourteen frogs were immersed in water; six recovered and eight died. The hibernation tank had not contained sufficient water. The six frogs which recovered were returned to the same tank but water 2 - 3" in depth was placed in it.

At no time were the frogs which hibernated torpid. The same applies to the eighteen frogs which are hibernating in the winter of 1966.

On 12th February 1966, two frogs were obtained from Robert Howard, a technician in the Zoology Department of Reading University. He had bred them from tadpoles which he obtained from Kendrick Girls' School. They were 15 mm. long and 0.5 gm. in weight. One died within a week but the other, which was christened Uno, survived and on 10th September 1966 weighed 30 gm. and was 60 mm. in length. This was an extremely high rate of growth for a period of only seven months. Uno had developed from a tadpole with a kink in her tail and consequently had distortion of the urostyle and asymmetry of the pelvic girdle. This resulted in uncoordinated movement of the back legs. In the field the resulting lack of mobility would militate against survival.

On 27th February 1966, the six surviving frogs were brought out of hibernation and placed in the 15" x 11" x 11" tank with turf and a pond. They ranged from 40 mm. to 31 mm. long. They were fed on small woodlice, Oniscus asellus L., owing to the scarcity of other arthropods at so early a date. A few small earthworms were accepted.

As the weather improved and the frogs increased in size, they were fed on spiders, millipedes, beetles, caterpillars (including those of the Small Angle Shades Moth, Euplexia lucipara L., taken on ferns), earthworms and commercial maggots. Whilst they were feeding on worms their rate of growth was very rapid.

On 7th July 1966 a successful attempt was made to sex the seven frogs. One male was identified by the nuptial pads which showed clearly on the ventral surface of the anterior thumbs. The other six were females. It is of interest at this stage to compare the nuptial pads of frogs and toads and to think about the reasons for the difference in their position. In the frog the pads are ventral whilst in the toad they are dorsal. What difference should there be in the grip of the males during amplexus? By 12th August it was noticed that although the frogs increased in weight there was no appreciable increase in length. This seemed to suggest that the gonads were developing.

On 4th September a successful attempt was made to identify individual frogs. As the markings of frogs seemed to present insurmountable difficulties, a suggestion made by Mr. Michael Hardy, of the Reading University Zoology Department, was tried out. The frogs which developed from the albino spawn had acquired patches of black pigment which centred on the glands on their backs. Drawings were made of the black marks and the individual patterns proved to be diagnostic. The 1966 frogs are

similarly marked.

It has been postulated that large frogs could turn cannibal. This was proved on 24th August 1966, when two newly metamorphosed frogs about 12 mm. in length were inadvertently placed in the same tank as some larger frogs about 60 mm. in length. Both the small frogs were eaten immediately by one of the large frogs. When one thinks of the vast numbers of newly metamorphosed frogs which swarm around the ditches and ponds before they disperse, it seems highly likely that a considerable number of such frogs are eaten by their larger relations. Two samples of newly metamorphosed frogs totalling seventy frogs which were taken near a ditch near Little John's Farm, Reading, in July 1966 were weighed and measured. Little variation was found; they averaged 12 mm. in length and 0.15 gm. in weight.

On 28th March 1966, albino spawn was again laid in the artificial pond in the garden of 11, Buxton Avenue, possibly by the same female frog. (If this frog returns to the pond in 1967, I hope to photograph it.) The 1966 albino spawn was laid in one clump, 600 ml. in volume and containing approximately 3,000 eggs. The large number of eggs in the clump suggests that a very large female frog was responsible. During a visit to the Collier's Claypit in Tilehurst on 20th March 1966, a mass of frog spawn 5' x 2'6" x 4" was found in one section of ditch, although many seemingly more suitable ditches were not used for oviposition. As many as 1,250 eggs were counted in a sample of spawn 250 ml. in volume, and from this figure it was deduced that there were 200,000 eggs in the patch, and that approximately 120 female frogs had laid in this one ditch, which was in danger of drying up. My sister and I, on an errand of mercy, dispersed 30 litres of spawn.

On 3rd April 1966, 95 per cent of the spawn was seen to be hatching. Albino spawn would take a very long time to hatch in the field owing to the fact that light would be almost totally reflected by the white egg. On 8th April, embryos 7 mm. long were hatching; they had grey eyes but no other pigment. Development proceeded as in 1965. When metamorphosis commenced, the tadpoles periodically surfaced in order to take gulps of air. Before they take in air they first of all release a bubble. These bubbles collect on the surface of the water.

On 28th April 1966, following prolonged sunshine, it was noticed that the tadpoles, which by now had become heavily pigmented, became transparent about two hours after sunset. It seems as if the bright sunshine had caused the melanophores to contract. The delay was due to the fact that the change in the

melanophores is effected by the endocrine system. After the melanophores had contracted, the internal anatomy (especially the nervous system) was to be seen clearly.

Some of the frogs completed metamorphosis in June and were placed in a vivarium. It was found that during metamorphosis they lost 50 per cent of their weight. No food is taken from the time that the frogs develop four legs until the tail is reabsorbed. The loss of weight could be accounted for by the energy used during the changes.

The developing frogs, which hatched from the albino spawn laid in 1965 and 1966, were weighed and measured at monthly intervals and the gains in weight have been recorded as percentages. Because these frogs have been bred in very favourable conditions, comparable figures were sought in the field. During this operation, 179 frogs and 339 toads were weighed, measured, and then released.

The seven frogs bred from the 1965 albino spawn were weighed and measured before being allowed to hibernate on 12th November 1966. They averaged 60 mm. in length and the weights ranged from 27 gm. to 40 gm. They will be weighed and measured again when they emerge from hibernation. These frogs should breed precociously in the spring of 1967, their second year. Due to intensive feeding, their weights and lengths are those of fourth year frogs.

The eleven frogs bred from the 1966 albino spawn, ranging from 30 mm. to 45 mm. in length and 3.7 gm. to 10.5 gm. in weight, were also allowed to hibernate. They also will be weighed and measured when they come out of hibernation. On 26th December all the frogs were in good condition.

A greenhouse 8' x 7' and a frog house 9' x 6' have been built so that complete control of the breeding can be maintained. The frogs, if they breed in 1967, will be bred in individual tanks, the one male being allowed to fertilise more than one female. It is hoped to ascertain whether the female lays all albino spawn or a mixture of albino spawn and normal spawn. After 1967, breeding should take place in the frog house as well.

I envy the man who breeds the Fruit Fly, Drosophila, which completes a generation in weeks. Frogs are not normally sexually mature until their third or fourth year. That makes an F₂ generation six years away. In the words of Robert Browning, "Grow old along with me! The best is yet to be."

Thanks are due to the many people who have given me advice and assistance.

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BATS OF THE READING AREA

By M. G. Hardy, M.A.

In the British Isles there are perhaps 14 species of bats, belonging to two families, the Rhinolophidae or horseshoe bats (2 species) and the Vespertilionidae (the rest). Of these, half a dozen are certainly to be found within the Reading area. Some are widely distributed and common, but of the rest we can say little.

The Pipistrelle, Pipistrellus pipistrellus (Schreber), is the 'common' bat. Its fast, jerky flight, and habit of keeping to a well defined beat, for example, up and down a stretch of road, are characteristic. Being so small, it can creep through very small openings, and nearly all houses both new and old contain potentially ideal roosting places for this species. Situations in which I have found them are beneath a corrugated asbestos roof, within a cavity wall, and in attics; in two cases the animals were living wedged between beams and brickwork, and in another they were hidden in the space between the tiles and underlying felt. It seems they prefer for their sleeping quarters situations into which they can squeeze. Being highly gregarious, colonies may sometimes number several hundred.

The Noctule, Nyctalus noctula (Schreber), is another widely distributed species in the Thames valley. With a wing-span of 13 inches, it is one of the largest of our bats. It appears soon after sunset, and is often to be seen flying in company with its avian diurnal counterpart, the swift, before the latter have retired for the night. The noctule is the easiest bat to identify; it has a fast dashing flight, usually at tree-top height, characteristically interrupted by steep dives, presumably to intercept an insect beneath it. At a distance swifts and noctules may be confused, but not when seen clearly. The wings of the swift beat rapidly through a small arc whereas those of the noctule are moved through a much greater distance and sometimes appear almost to meet under the body on the completion of the down-stroke. The noctule certainly has the edge on the swift in manoeuvrability.

Englefield Park in early summer, when vast numbers of chironomid midges are emerging from the lake, is a favourite hunting ground and, in fact, a typical habitat for this species. On some evenings I have estimated 50 - 100+ to be present.

Summer colonies of noctules live mainly in hollow trees, and in my experience woodpecker or similarly sized holes are

preferred. Details of several roosts found locally are given below. They may be located by observing the direction from which the bats appear to come when first emerging (this isn't easy!) and thus the approximate position of the roost, and then listening for the high-pitched 'chittering' that occurs before the bats come out to hunt.

NOCTULE SUMMER ROOSTS

<u>Locality</u>	<u>Situation</u>	<u>Cavity</u>	<u>Height above ground</u>	<u>Max. no. of bats emerging</u>	<u>Date</u>
Sonning railway cutting	Pine	Woodpecker hole?	9 ft.	102	20 May 1957
Woodcote	Oak	"	c. 50 ft.	(10-20)	2 June 1960
Leighton Park	Roof of boiler house		c. 20 ft.		30 April 1962
White- knights Park	Pine	Top of broken trunk	c. 20 ft.	-	1964
"	Oak	Split in trunk	c. 40 ft.	43	23 April 1965
"	Oak	Woodpecker hole?	c. 10 ft.	32	3 May 1966
Englefield	Oak	"	c. 50 ft.	20	18 June 1966

Unlike the majority of bats, which hunt throughout the night with occasional periods of rest, noctules fly for a restricted period at dusk and dawn. The evening flight lasts 60 -70 minutes. The bats emerge in groups, the individuals often coming out in rapid succession, and they then immediately disperse so that, shortly after they are all out, none can be seen in the immediate vicinity of the roost.

The return of the bats, so well described by Charles Oldham in his classic essay on this species (Zoologist 1901 p. 51-59), is, as would be expected, more scattered. It is by this time too dark to see clearly, but their behaviour is now quite different. The bats, on returning to the tree circle round, often in twos and threes at high speed; occasionally they fly up to the hole, perch for an instant and then go off again. Because of this it is almost impossible by observation alone to determine how many actually enter. The number of bats emerging varies considerably from evening to evening, and, as has been argued by Vesey-Fitzgerald, it seems that individuals are not constant to a specific roost. Also, dens occupied in the early summer may be vacated later on; a considerable movement of these bats must occur in late June and July. Noctules, it seems, are very vulnerable to being evicted by hole-nesting birds. On several occasions holes I have known to have been previously inhabited by these bats have subsequently been occupied by jackdaws, starlings, or grey squirrels. I have no definite evidence that eviction has taken place, but I think it likely. Bats have very few enemies, but it would not surprise me if squirrels were shown to be important in this respect. Further information would be valuable.

The long-eared bat, Plecotus auritus (L.), (another very similar species, P. austriacus (Fischer), has recently been shown to occur in Britain) is also widely distributed, but is more secretive and later in emerging than the noctule. It is a woodland species but is not confined to this habitat. For several years I have watched these bats in a coppice of young ash trees near Englefield. Early May is the best time, before the leaves have fully come out. For much of the time the bats can be seen flying in and out and hovering amongst the topmost twigs of the trees, then darting off to another, appearing very like large moths. What they are feeding on here I do not know, but certainly noctuid moths often form a major part of their diet. Large prey, e.g. Yellow Underwing moths, are not eaten on the wing but are taken to a convenient perch, which may be used again and again. Piles of moth wings and legs in the corner of a porch or summer house are a sure sign that a long-eared bat is about.

Many moths, notably in the family Noctuidae, have ears which are especially sensitive to ultrasonic sounds, and thus are efficient bat-detectors, enabling their possessor to take evasive action before too late. Jingling a bunch of keys produces ultrasonic sounds besides those that are audible to us. While I was out in Whiteknights Park on the evening of 23rd August, 1966, several Brimstone moths, Opisthograptis luteolata (L.)

(family Geometridae) were flying along the hedgerows. On my shaking the keys close by, they dived into the herbage; this was a very rapid movement and quite different from their normally slow fluttering flight. It is not unlikely that long-eared bats are especially adapted to capturing moths, for their echo-locating cries are extremely faint, and they thus stand a greater chance of approaching undetected. Their huge ears would, of course, be correlated with this.

Daubenton's bat, Myotis daubentoni (Kuhl), is the fourth and last that I regard as being fairly common round Reading. It is 'the' water-bat, though, of course, most bats will hunt over water at times. Characteristically, these bats fly low over the surface, which they may be seen occasionally to touch as if they are actually picking insects off the water. I have watched these bats from several bridges along the Loddon - the ideal bat-watching bridge is one that gives an unobstructed view of the river, without too many surrounding trees, and facing west - such a one is that at Sherfield. Bats of the genus Myotis usually hibernate in caves or similar situations. Daubenton's Bat, Natterer's Bat, M. nattereri (Kuhl), and the Whiskered Bat, M. mystacinus (Kuhl), were recorded long ago as hibernating in a chalk tunnel near Henley, and these three species were present when I went there on 15th February, 1953.

I should be very pleased to hear of any colonies that members know of, particularly if their identity is in doubt.

THE FLORA OF THE WATERWAYS OF READING

By A. M. Simmonds

Situated as it is between the confluence of the Thames and its tributary the Kennet, the Borough of Reading contains considerable stretches of waterways. The two rivers, the Holy Brook, and many connecting streams furnish several miles of riparian habitat, and thus considerably augment the urban flora already considered in the Reading Naturalist (no. 15).

Within built-up areas, the banks of the canalised Kennet have been urbanised with concrete or brick walling, which affords but little scope for plant growth, although even here may be found lowly mosses and liverworts, and an occasional flowering plant, such as Lycopus europaeus L. (Gipsy-wort), Scutellaria galericulata L. (Skull-cap), and Eupatorium cannabinum L. (Hemp Agrimony). Such a place is the stretch of water alongside the Chestnut Walk by the Abbey Ruins. However, where the water-side banks have been left in a fairly natural state, as in the outlying parts of the Borough to the west, north, and east, a variety of semi-aquatic plants flourish. Many of these are typical Monocotyledons, "reeds, rushes and sedges". The commonest species appears to be Glyceria maxima (Hartm.) Holmberg, which is a Reed Grass. This should not be confused with Phragmites communis Trin., the Common Reed, which seems to be absent from our urban water-communities, although abundant higher up the Kennet. G. maxima is present in abundance along both the Thames and the Kennet and especially so in marshy ground such as that bordering the backwater to Caversham Mill. Here, too, in abundance is Impatiens capensis Meerb. (Jewel-weed or Orange Balsam). It has most attractive flowers, orange splashed with red, which dangle on thin stalks. It is an introduced species which has reached the Thames via the Enborne and Kennet, and is spreading rapidly. Its grander relative, I. glandulifera Royle (Policeman's Helmet or Himalayan Balsam) is, as yet, comparatively rare in our area. Both species have explosive fruits.

Sedges, with their triangular stems, are fairly abundant, the two commonest species being Carex acutiformis Ehrh. (Pond Sedge) and C. riparia Curt. (Great Pond Sedge). C. paniculata L. (Tufted Sedge) is rare. True rushes (Juncus species), known by their cylindrical unjointed stems are infrequent; J. inflexus L. (Hard Rush) is the one most likely to be seen.

Acorus calamus L. (Sweet Flag) with its unusual green

flower-spike is quite unlike the Water Flag or Yellow Iris (Iris pseudacorus L.). It grows in clumps near Reading Bridge (Hill's Meadow). The curious wrinkling of the sword-like leaves is a useful clue to its identity. Swans appear to be fond of this plant, and pieces of rhizome are often seen detached and floating, thus helping to colonise the plant. It seems to be absent from the Kennet.

Typha latifolia L. (Reedmace) and Scirpus lacustris L. (the true Bulrush) occur sparingly, but Sparganium erectum L. (Bur-reed) with its spiky round fruits is frequent as is also another Reed-grass, Phalaris arundinacea L., with very reed-like leaves and pinkish inflorescence.

Growing at the water's edge, where the bank is less steep, may be found occasionally Cardamine amara L. (Large Bitter-cress), Myosotis scorpioides L. (Water Forget-me-not), Ranunculus sceleratus L. (Celery-leaved Buttercup), Barbarea vulgaris R. Br. (Winter Cress), Rorippa amphibia (L.) Bess. (Great Yellow-cress), Bidens cernua L. (Nodding Bur-marigold) and B. tripartita L. (Three-cleft Bur-marigold). Both these last species have awned fruits armed with barb-like deflexed bristles. Brassica rapa L. (Bargeman's Cabbage) is an alien Crucifer which is fairly common along the Thames, although it does not appear to be along the Kennet yet. It is a biennial with conspicuous coarse turnip-like radical leaves, and its showy yellow flowers appear in spring.

In summer the banks are gay with purple Loosestrife (Lythrum salicaria L.), Great Willow-herb (Epilobium hirsutum L.), Meadow-sweet (Filipendula ulmaria (L.) Maxim.), Hemp Agrimony, Comfrey (Symphytum officinalis L.) and St. John's-wort (Hypericum tetrapterum Fr.). That troublesome family, the Umbellifers, is represented by Oenanthe crocata L. (Hemlock Water-Dropwort), a rather coarse plant, and the much more elegant Conium maculatum L. (true Hemlock) with finely cut leaves and an unpleasant smell; both these species are very poisonous. These are followed in July and August by the aromatic and harmless Angelica sylvestris L. (Wild Angelica). Aster novi-belgii L. (Michaelmas Daisy) has established itself at Hill's Meadow, View Island, and further downstream, and provides colour and interest in the autumn.

Purely aquatic plants are sparse. Nuphar lutea (L.) Sm. (Yellow Water-lily) flowers above Berkeley Avenue Bridge, and also in the Caversham Mill stream. Water Crowfoot (probably Ranunculus aquatilis L. s. sp.) can be seen in the Holy Brook

just below its entry into the Borough. Sagittaria sagittifolia L. (Arrowhead) has been seen, though not flowering, just below Berkeley Avenue bridge. Callitriche L. species (Water Starwort) and Apium nodiflorum (L.) Lag. (Fool's Watercress) inhabit almost stagnant water at Mill Green, Caversham.

The water-side trees are mainly pollarded Salix fragilis L. (Crack Willow) and the occasional Alnus glutinosa L. (Alder) whose colourful male catkins are a harbinger of spring. There is a handsome Purple Osier (S. purpurea L.) in Hill's Meadow.

Where the Thames is an amenity, as along the Promenade and Christchurch Meadow, the necessity of keeping herbage under control has impoverished the plant life. It is to be hoped that in future river-side developments the lovely and typical plants of our watersides may not be too ruthlessly destroyed, but left for all to enjoy.

JUNIPER VALLEY: SOME OBSERVATIONS AND PROBLEMS

By H. H. Carter, M.A. B.Sc.

Juniper Valley takes its unofficial name from its most conspicuous feature, the fine stand of Juniperus communis L. which occupies the greater part of its sides. It is a fine example of a dry valley in the chalk downs, leading somewhat west of south from Hogtrough Bottom towards Lowbury Hill, in the 1-kilometre square whose national grid reference is SU 540 630. The more open, eastern slope supports several species of rare plants, and a part of it has been enclosed to form the Aston Upthorpe Nature Reserve managed by the Berkshire, Buckinghamshire and Oxfordshire Naturalists' Trust.

Among these rare species is Pulsatilla vulgaris Mill. (Anemone pulsatilla L.), the Pasque Flower, which forms two colonies here, one enclosed within the reserve and one on the unenclosed slope immediately above it. The lower colony was surrounded in 1961 with a fence of 1" mesh wire netting, the bottom edge of which was buried to a depth of 15 cm. (6") while the top edge was garnished with barbed wire, with the object of excluding grazing animals (sheep and rabbits) and discouraging picking by humans. This measure was taken because it was then apparent that although the plants flowered annually, few or no seed heads survived the flowering season and the colony was therefore in danger of extinction. The same state of affairs prevailed in the upper colony.* It was hoped that if the plants could be allowed to set seed, the wind-borne seeds would take root on other parts of the slope. So far this hope has not been fulfilled. On the contrary, damage to the plants has continued. The flower stalks are nipped off close to the ground when in bud,* or the flower itself is nibbled away, leaving only the receptacle, or the upper part of the stalk may be bitten through after the seeds have formed. That the inner wire netting enclosure has afforded partial protection against this damage is shown by the following census of the two colonies, taken on 20th May 1966:-

	Plants	Flowering stems	Bitten off	Surviving
Upper colony	146	140	137	3
Lower colony	92	31	13	18

* A. M. Simmonds. The Ashton Upthorpe Nature Reserve.
B.B.O.N.T. Annual Report 1966.

It will be noticed that although the survival rate is much higher in the lower colony, the number of plants which attempted to flower is less, (It must not be assumed that each plant produces only one flowering stem, or none; some plants produce as many as four or five.) The non-flowering plants within the enclosure are generally small and somewhat spindly, with as few as two or three leaves. Three possible causes for this are suggested.

- (a) The plants have been disturbed by moles and have not yet fully re-established themselves.
- (b) The plants are competing unsuccessfully with coarse grasses, which in the absence of grazing animals are tending to form a mat of vegetation.
- (c) The plants are seedlings.

As these small plants are found to occur both on molehills, where they are fully exposed, and among the long grass, neither (a) nor (b) can be the sole explanation, but they may well be contributory causes. In an attempt to elucidate this problem, it is proposed to rake over the area within the inner enclosure late in the year when the leaves of the Pasque Flower have died down (if indeed they do), and so remove the mat of dead grasses and open up the dense cover which is forming. It may then appear advisable to cut the grass with shears, particularly round the edges. Unfortunately it will not be possible to control the activities of the moles as well, so that the results will not necessarily be conclusive. It may even happen that when the surrounding grass is discouraged the biting of stems will increase.

The animal responsible for this biting off has not been identified, though I have recently been trying, by trapping and observation, on the lines suggested by Mrs. Simmonds,* to find out what it is.

On the evening of Friday, 6th May, I laid out a line of six Longworth small mammal traps along the length of the reserve, two being inside the inner wire netting enclosure. All the traps were pre-baited (i.e. food and bedding were supplied, and the trap-door fastened up so that mice could go in and out freely, and become used to the traps). On the morning of 9th May all the traps were set, and it was obvious that the two traps within the enclosure had been visited, the food eaten and a quantity of droppings deposited during the pre-baiting period.

The results of the trappings are given in tabular form below:-

TRAP LOCATIONS

(inside small enclosure)(inside main fence of the reserve)

	1	2	3	4	5	6
May 9	a.m. all traps set.					
May 9	p.m. nil	nil	nil	<u>Apodemus f.</u>	nil	nil
May 10	a.m. used, empty.	2 <u>Apodemus j.</u>	nil	nil	nil	nil
	p.m. nil	nil	nil	nil	nil	nil
May 11	a.m. <u>Apodemus j.</u> <u>Apodemus f.</u> nil nil nil nil					
	(Traps 3 to 6 were now moved to form a line up and down the slope, with Trap 4 joining Traps 1 and 2 inside the small enclosure.)					
May 12	p.m. <u>Apodemus</u> <u>Apodemus j.</u> nil nil nil nil					
May 13	a.m. <u>Apodemus</u> <u>Apodemus jm.</u> nil <u>Apodemus f.</u> nil nil					
	p.m. nil <u>Apodemus jm.</u> nil nil nil nil					
	(Traps 3 to 6 were moved again to the upper colony of <u>Pulsatilla</u> outside the main fence of the reserve, and all traps pre-baited.)					
May 16	p.m. Traps 3 - 6 set. (Trap 5 had been occupied).					
May 17	a.m. Traps 1 & 2 set. nil nil nil nil					
	p.m. nil nil nil nil nil nil					
May 18	a.m. <u>Apodemus m.</u> <u>Apodemus m.</u> nil nil nil nil					
	p.m. nil nil nil nil nil nil					
May 19	a.m. <u>Apodemus</u> <u>Apodemus</u> nil nil nil nil					
	p.m. nil nil nil nil nil nil					
May 20	a.m. <u>Apodemus</u> nil nil nil nil nil					

(All traps were removed.)

The species shown as Apodemus is A. sylvaticus (L.) the Wood-mouse or Long-tailed Field-mouse. The abbreviations m., f. and j. indicate male, female, and juvenile. These results may be summarised as follows:-

Only one species was taken, A. sylvaticus L. This species was taken only within the inner enclosure, and with one exception only during the night. One trap was used outside the enclosure while pre-baited.

When released, most individuals made their way to one or other of three holes inside the enclosure; one had a hole outside but only 3 or 4 metres from the fence. It therefore appears highly probable that Apodemus is the only small mammal resident on the slope, and has been favoured by the growth of long grass in the inner enclosure. The plants attacked here, presumably by Apodemus, were mostly bitten off well above ground at the late flowering or early seeding stage, and this continued during the trapping period. In the upper colony, a larger proportion of plants were bitten off close to the ground, and some leaves had also been eaten. This damage had already been done before trapping began, and as already mentioned, the attack here was much more intensive. This difference in the pattern of feeding, combined with the trapping results, suggests that two or more different species are responsible. Animals known to frequent the eastern slope of the valley, which might be responsible and would not be taken in the Longworth traps, are Oryctolagus cuniculus (L.) (Rabbit) and Perdix perdix (L.) (Partridge). Lepus capensis L. (Brown Hare) and Phasianus colchicus L. (Pheasant) occur just outside the valley and sometimes venture on to its juniper-covered western slope. I regard the Rabbit as the principal suspect. The question might perhaps be answered by visual observation in late March or early April when the buds of Pulsatilla first appear.

Appendix A

While working in the valley, I took the opportunity of collecting or observing some of the other members of its fauna. Their names, and my impression of their status, are appended. Some birds from the immediate vicinity are also included.

Mammals

Insectivora

Talpa europaea L. (Mole)

Sorex araneus L. (Shrew)

Present in small numbers. A colony of 10 or so in the long grass on the floor of the valley below the colonies of Pulsatilla.

Lagomorpha

Lepus capensis L. (Hare)

Common on Aston Upton Downs, but seldom enters the valley.

Oryctolagus cuniculus (L.) (Rabbit)

Two groups of burrows near the reserve, both occupied.

Rodentia

Apodemus sylvaticus (L.) (Long-tailed

Field-mouse) See trapping records above.

Birds (Species with territories extending into the valley marked *)

*Perdix perdix (L.) (Partridge)

2 pairs.

*Phasianus colchicus (L.) (Pheasant)

1 male.

Vanellus vanellus (L.) (Lapwing)

Nests on level Downs around the valley, and flies over.

Burhinus oedicnemus (L.) (Stone Curlew)

ditto

Columba oenas L. (Stock Dove)

1 seen near the valley.

C. palumbus L. (Wood Pigeon)

Several pairs in the wood immediately north of the valley.

Streptopelia turtur (L.) (Turtle dove)

Common in the wood, and wherever there are trees.

Cuculus canorus L. (Cuckoo)

Males seen in and out of the valley; females probably lay in nests of small birds over the same area.

Apus apus (L.) (Swift)

Feeds in the valley, but no suitable nesting sites.

<u>Alauda arvensis</u> L. (Skylark)	As <u>Vanellus</u> above.
<u>Hirundo rustica</u> L. (Swallow)	As <u>Apus</u> above.
<u>Corvus corone</u> L. (Carrion Crow)	Present, and doubtless feeds in valley on occasion.
<u>Corvus frugilegus</u> L. (Rook)	Passes over, but not known to feed.
<u>Parus major</u> L. (Great Tit)	In wood north of the valley, common.
<u>P. caeruleus</u> L. (Blue Tit)	ditto.
<u>P. ater</u> L. (Coal Tit)	ditto.
<u>Troglodytes troglodytes</u> (L.) (Wren)	ditto.
* <u>Turdus ericetorum</u> Turton (Song Thrush)	Occurs within the valley, and probably breeds.
* <u>T. merula</u> L.	ditto.
<u>Erithacus rubecula</u> (L.) (Robin)	As <u>Parus</u> above.
<u>Sylvia atricapilla</u> (L.) (Blackcap)	ditto.
* <u>S. communis</u> Latham (Whitethroat)	3 or 4 pairs in the valley, abundant outside, breeds.
* <u>S. curruca</u> (L.) (Lesser Whitethroat)	A singing male at the south end of the valley.
<u>Phylloscopus trochilus</u> (L.) (Willow Warbler)	As <u>Parus</u> above.
<u>P. collybita</u> (Vieillot)(Chiffchaff)	ditto.
<u>Prunella modularis</u> (L.) (Hedge Sparrow)	ditto.
* <u>Anthus pratensis</u> (L.) (Meadow Pipit)	2 or 3 pairs in the valley, common outside, breeds.
* <u>Chloris chloris</u> (L.) (Greenfinch)	ditto.
* <u>Carduelis cannabina</u> (L.) (Linnet)	5 or 6 pairs in the valley, abundant outside, breeds.
* <u>Fringilla coelebs</u> L. (Chaffinch)	1 pair in the valley, several outside, breeds.
* <u>Emberiza citrinella</u> L.(Yellowhammer)	1 or 2 pairs in the valley, abundant outside, breeds.
<u>E. calandra</u> L. (Corn Bunting)	As <u>Vanellus</u> above.

Reptiles

<u>Anguis fragilis</u> L. (Slow-worm)	A pair seen mating in the valley by Mrs. Simmonds.
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Mollusca (all Gastropoda)

Pulmonata

- Theba cantiana (Müller) Abundant throughout the more open parts of the valley.
- Helicella itala (L.) 2 dead shells found in disturbed soil in the reserve.
- H. (Cernuella) virgata (da Costa) ditto.
- H. (Candidula) caperata (Montagu) Not uncommon in the valley and reserve, about 6 seen.
- Cepaea nemoralis (L.) One dead shell found among juniper on the western slope.
- Agriolimax agrestis (L.) 2 among long grass on the floor of the valley.
- Aspidobranchia
- Pomatias elegans (Müller) As H. itala above.

All these are snails, except Agriolimax which is a slug.

Crustacea

- Armadillidium vulgare L. (Pill Woodlouse) The commonest visible invertebrate.

A single specimen of another species of woodlouse (probably Porcellio sp.) was seen but could not be identified.

Insects

To attempt to collect and identify comprehensively the members of this class would have taken more time than I could afford. A few isolated observations are given here.

Hymenoptera

- Bombus lapidarius (L.) One queen of this red-tailed Bumble-Bee was seen. Another Bombus sp. is also present.
- Andrena armata (Gm.) Several females and one male of this solitary bee were seen.
- Myrmica ruginodis Nyl. A worker of this ant seen carrying one of the following.
- Lasius flavus (F.) The hillocks of this underground ant occur all over the valley, making it the commonest non-microscopic animal there.
- Tenthredo mesomelas L. I took a female of this sawfly.

Spiders

Dictyna latens (F.) One found on Juniper on the western slope. Members of this and a few other families have a special organ which secretes silk in a broad ribbon, and a comb-like structure on each hind foot for winding the ribbon round their prey.

Lycosa monticola (Clerk) Common on the western slope. This, like the next two species, is a hunting spider which makes no web, and uses its silk only for wrapping its eggs.

L. pullata (Clerk) This common species is less numerous in the valley than monticola.

Tarentula barbipes (Sundevall) One specimen taken on the western slope.

Pisaura mirabilis (Clerk) Although larger and more conspicuous and quite unrelated to the following species, this very common species has similar habits and habitat.

Philodromus aureolus (Clerk) This little Crab Spider is common on nettles at the entrance to the valley, where it sits motionless, waiting for careless insects.

Tibellus oblongus (Walkenaer) I saw one specimen of this long, narrow-bodied species in long grass on the floor of the valley, Despite its very different shape, it belongs to the same family as Philodromus.

Amaurobius terrestris (Wider) Not uncommon in the reserve. Its web is like that of its relative the House Spider (Tegenaria spp.) but much smaller.

Meta segmentata (Clerk) Abundant on Juniper on the western slope, where it spins an orb web like that of the next species and other members of the family.

Araneus redii (Scopoli) Abundant on nettles and other tall plants near the entrance to the valley. A local species, closely related to the Garden Spider A. diadematus Clerk.

Linyphia hortensis Sundevall Common on Juniper at the northern end of the reserve, where it builds a horizontal sheet web typical of its family.

Mites

The queen of Bombus lapidarius mentioned above was carrying a number of mites, probably Parasitus sp.

(T. E. Hughes, Mites or the Acari, p. 30; London 1959.)

Appendix B

A few species which have been recorded in the valley by myself or others in previous years, but were not encountered by me this year, are listed below.

Mammalia

Meles meles (L.) (Badger)

Said to occur in the wood north of the valley.

Birds

Falco tinnunculus L. (Kestrel)

Up to 2 pairs recorded till quite recently.

Strix aluco L. (Tawny Owl) Resident.

All these owls have been recorded in recent years within a mile of the valley.

Athene noctua (Scopoli)

(Little Owl) Resident.

Asio otus (L.) (Long-

eared Owl) Vagrant

Asio flammeus (Pontopp.)

(Short-eared Owl) Winter visitor.

Regulus regulus (L.) (Goldcrest)

Recorded in April, 1961 and December, 1964 in some numbers in Juniper on the western slope.

Insect

Colostygia multistrigaria

Recorded in Reading Naturalist no. 17.

WEATHER RECORDS IN 1966

By A. E. Moon

The data refer to Reading University Meteorological Station. A "rain day" is a day on which rainfall equals or exceeds 0.01 of an inch. The averages for temperature refer to the period 1931-60, those for the amount of precipitation and number of rain days to 1916-50, and those for sunshine to 1921-50. For the designation of frost and ground-frost days see Weather Records in 1961.

STATION - READING UNIVERSITY. HEIGHT ABOVE MEAN SEA LEVEL - 148 ft.

		JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	YEAR
MEAN DAILY TEMPERATURE °F.	MAX.	41.5	48.5	51.5	54.1	62.0	70.1	68.0	68.6	66.8	58.2	47.3	48.9	57.2
	MIN.	33.7	40.2	37.6	41.8	44.8	53.0	53.2	52.2	50.4	46.5	37.5	37.0	44.0
	MEAN.	37.6	44.3	44.5	47.9	53.4	61.5	60.6	60.4	58.6	52.3	42.4	42.9	50.6
	DIFFERENCE FROM NORMAL	-1.4	+4.4	+0.6	-0.8	-0.9	+1.4	-2.5	-2.4	+0.2	+0.9	-2.4	+1.9	-0.1
EXTREME TEMPERATURES °F.	E. MAX.	54	56	58	72	77	81	77	81	73	67	59	55	81
	DATE	29	8,19	20	30	1, 2	9	3	20	9	3	7	29	Jun. 9 Aug. 20
	E. MIN.	18	32	26	32	38	43	44	44	40	37	28	25	18
	DATE	19	14	20	14,15	9	1	18	2,24	17	26,29	24,25	26	Jan. 19
	E. GRASS MIN.	12	27	17	23	28	35	38	35	32	29	21	16	12
DAYS WITH " "	DATE	15	24	20	21	10	1	18	2	16	26,29,30	24	26	Jan. 15
	FROST	14	0	2	0	0	0	0	0	0	0	6	3	25
	GROUND FROST	18	10	22	7	7	0	0	0	1	7	18	18	108
SUNSHINE HOURS	SUM.	40.8	32.7	130.3	77.4	238.1	197.2	163.0	196.1	171.1	72.4	64.1	40.2	1423.4
	% POSS.	15	12	35	19	50	40	33	44	45	22	24	16	32
	DAILY MEAN	1.31	1.17	4.20	2.58	7.68	6.57	5.26	6.32	5.70	2.33	2.13	1.30	3.90
PRECIPITATION ins.	AMOUNT	1.31	3.45	0.51	3.70	2.10	2.55	3.23	3.28	1.55	5.15	1.55	2.39	30.77
	RAIN DAYS	17	19	10	22	11	11	15	13	8	20	16	23	185
	MAX. RAIN IN 1 DAY	0.39	0.53	0.14	0.61	0.41	1.28	0.62	0.64	0.50	0.95	0.42	0.33	1.28
	DATE	30	9	28	14	11	22	5	21,29	30	13	5	1	Jun. 22
LONGEST RUN OF CONSECUTIVE RAIN DAYS	9	10	6	12	5	5	4	4	2	8	5	8	-	
LONGEST RUN OF CONSECUTIVE DRY DAYS	11	5	10	3	6	5	4	9	13	3	4	3	-	
SNOW OR SLEET DAYS	6	1	4	3	0	0	0	0	0	0	1	0	15	
DAYS SNOW LYING	2	0	0	2	0	0	0	0	0	0	0	0	4	
VISIBILITY FOG AT 0900 G.M.T.	4	1	0	0	0	0	0	0	0	6	4	4	1	20
THUNDERSTORM ACTIVITY	DAYS OF THUNDER	0	2	0	0	3	2	4	1	0	1	0	0	13
	DAYS OF HAIL	0	0	0	0	0	0	0	0	0	0	0	0	0
AVERAGES MEAN DAILY TEMPERATURE °F.	MAX.	44.2	45.5	51.4	57.0	63.5	69.1	71.8	71.6	66.6	58.6	50.5	46.0	57.9
	MIN.	33.8	34.2	36.5	40.5	45.3	50.9	54.5	54.0	50.2	44.2	39.2	36.0	43.3
	MEAN.	39.0	39.9	43.9	48.7	54.3	60.1	63.1	62.8	58.5	51.4	44.8	41.0	50.7
PRECIPITATION	AMOUNT	2.41	1.78	1.69	1.90	1.86	1.61	2.53	2.20	2.10	2.60	2.74	2.30	25.72
	RAIN DAYS	17	13	13	14	13	11	13	13	13	15	15	17	167
SUNSHINE	SUM.	52.7	70.0	120.9	156.0	195.3	210.0	192.2	182.9	138.0	105.4	63.0	46.5	1532.9
	DAILY MEAN	1.7	2.5	3.9	5.2	6.3	7.0	6.2	5.9	4.6	3.4	2.1	1.5	4.20

MONTHLY WEATHER NOTES

1966

- January This was the coldest January since 1963, and the 19th was the coldest January day since 24th of that year. It was also the dullest January since 1960.
- February The warmest since 1961 and the wettest since 1951.
- April It was the wettest April since reliable records began at the University station in 1921, and the 14th was the coldest April day recorded in the same period. Sunshine was also the lowest amount for April since records began in the Reading area in 1939. Temperature, however, reached 60°F for the first time this year on 8th (61°F).
- May The wettest since 1955 and the sunniest since 1959.
- June The warmest June since 1960, and the night of 9th/10th was the warmest June night since 30th, 1957.
- July Temperature and sunshine both well below normal. Some heavy falls of rain in short periods occurred; those worth mentioning and all occurring in a period of six minutes were 0.13" between 11.54 and 12.00 on 19th, 0.13" between 15.45 and 15.51 on 29th and 0.10" between 12.45 and 12.51 on 26th.
- August The maximum temperature of 60°F on 1st was the lowest August maximum since 6th 1962 (maximum then 57°F). It was the wettest August since 1960.
- September The night minimum temperature of 61°F on 4th was the highest September figure since 19th, 1961. The first autumn ground frost was recorded on 16th. The first ground frost did not occur until 16th October last year, in spite of the fact that September was a much colder month than the present one.
- October The wettest since 1960. The sunshine total was the lowest October figure since records commenced in Reading in 1939.
- November The first air frost of the present winter occurred on 3rd and the first snow (a slight shower) occurred early on 29th.
- December The warmest December since 1959, but sunshine amounts were the lowest since that year. The Christmas period gave the coldest spell of the month.

THE RECORDER'S REPORT FOR ENTOMOLOGY
1965-1966

By B. R. Baker, B.Sc., F.M.A., F.R.E.S.

Order Odonata (Dragon-flies)

Gomphus vulgatissimus (L.) Club-tail Dragon-fly

A fine specimen of this uncommon species was brought to the Museum on 7th June from the seemingly unlikely locality of the Conservative Party Offices in London Street. This striking black and yellow dragon-fly is known to breed in the river Thames and cast larval skins may at times be found in numbers on the river edge vegetation by Caversham Bridge. The adults of the larger dragon-flies habitually fly away from water soon after hatching and therefore the London Street area is perhaps not so surprising a one in which to see a specimen in flight, save the fact that this example conveniently entered an open window there. We have not recorded G. vulgatissimus since 1954, though doubtless a watch along Thames-side banks in late May and early June would produce further evidence of the continued existence of the species.

Order Trichoptera (Caddis-flies)

It is probable that in most species of caddis the female crawls down below the water surface to lay her eggs, and Mr. Price instances an observation made on the species Phryganea striata L. at Wokefield Common Fishpond on 28th May. The caddis, bearing the extruded egg-mass at the tip of its abdomen, was seen to crawl down a piece of grass and into the water where it remained submerged for five minutes. The specimen was alive when Mr. Price retrieved it after this time.

Order Hemiptera (Plant Bugs, Aphids, etc.)

Mr. Price records that the Nettle Ground Bug, Heterogaster urticae (F.) was to be seen in large numbers along the banks of the Holy Brook, Reading, during August 1966. Also that the aphids Macrosiphoniella artemisiae (Fonse.) and Plectrichophorus glandulosus (Kaltenbach) were extremely abundant on the plants of mugwort (Artemisia vulgaris L.) growing on waste land in Berkeley Avenue, Reading.

Order Lepidoptera (Butterflies and Moths)

Events quite early in the season seemed to forecast that 1966 might be a good year as regards immigrant Lepidoptera, but the promise of the month of May was not to be fulfilled later in the year:

Vanessa cardui (L.) Painted Lady Butterfly

Evidence of a considerable migration accumulated in late May. On 23rd, Dr. Watson reported a specimen on the main University site, whilst on 28th, the occasion of Mrs. Simmonds' excursion to Ashley Hill, members were able to see 5 - 6 specimens careering around the highest point of the hill. Occasionally a specimen would settle on, or close to the ground, then rapidly circle the summit again, returning to the same resting spot. The condition of these butterflies showed them to be considerably worn, (though this is not necessarily to be taken as evidence of a long, sustained flight). Further Painted Ladies were observed on 30th May over a wide area, viz. Inkpen Beacon, Savernake Forest, and West Woods (an extensive area west of Marlborough).

Colias croceus (Fourc.) Clouded Yellow Butterfly

We have no local records concerning early spring, but specimens were observed during August and September. These may have been the descendants of spring visitors from across the Channel or possibly themselves late immigrants. Dr. E. Burtt saw Clouded Yellows on 28th August and 2nd September close to 'Three Firs' turning at Burghfield (three examples on each occasion), and the Recorder saw a single specimen at Pamber Forest on 10th September.

Herse convolvuli (L.) Convolvulus Hawk-moth

A fine male specimen of this large hawk-moth was brought to the Museum on 24th October by Mrs. G. Rhymes of 25, Valentine Crescent, Caversham. The discovery was made when a line of washing was being attended to - H. convolvuli was quietly resting on a pair of socks!

Notes on Resident Species

Apatura iris (L.) Purple Emperor Butterfly

On the occasion of a visit to Pamber Forest on 5th June by members of the South London Entomological Society, a third-instar larva of this fine butterfly, discovered on a sallow bush in the marsh, high-lighted for the visitors their first experience of this classic locality.

Limnitis camilla (L.) White Admiral

Dr. Burtt records this species from the beechwoods close to the King Charles's Head at Goring Heath on 14th July. It is valuable to have records of this species from areas other than the oak woods of the Berks/Hants border.

Strymonidia w-album (Knoch) White-letter Hairstreak

Noted on several occasions between 20th July and 3rd August by Dr. Burt at Goring Heath.

Celastrina argiolus (L.) Holly Blue

A single specimen recorded on 2nd August at 45, Highgrove Street, by Mrs. A. M. Simmonds. This butterfly, of very uncertain occurrence, has a marked preference for shrubberies of town gardens, especially those stocked with holly, ivy, privet and laurel.

Euplexia lucipara (L.) Small Angle-shades Moth

Another 'garden' record: Mr. Price reports larvae of this species abundant on ferns in his garden at 6, Mansfield Road, Reading.

Order Hymenoptera (Bees, Ants and Wasps)

Woods Ants (Formica sp.)

Mrs. Simmonds and Miss Cobb reported wood ants very active at a site near Eversley on 27th March, 1966. Their activities produced a rustling sound among the dead leaves which was audible from a distance of several yards.

Order Diptera (Two-winged Flies)

In early autumn the Museum was called upon to identify various samples of flies all of which had been taken from within buildings. Although superficially such samples appear to consist only of the house-fly, Musca domestica L., detailed examination usually reveals a number of species present. Additional to M. domestica the following identifications were made:

Stomoxys calcitrans (L.) Biting House-fly

This species is generally larger than the common house-fly, from which it may easily be distinguished by a shiny, black dagger of a proboscis.

Musca autumnalis Deg. Autumn Fly

Very similar to the common house-fly, but having certain colour differences. Further, differs in habits by congregating and overwintering within buildings.

Pollenia rudis (F.) Cluster Fly

Larger than the house-fly and with wings which overlap when resting (not diverging as in house-flies). Clothed with fine golden hairs. Larva parasitic in earthworms.

The Recorder would like to express his thanks to Miss L. Cobb, Mrs. A. M. Simmonds, Dr. E. Burt and Mr. Arthur Price, and to the Director of Reading Museum, Mr. T. L. Gwatkin, for allowing the inclusion of those records kept at the Museum.

THE RECORDER'S REPORT FOR BOTANY
1965-1966

By B. M. Newman

The records listed this year have been sent in by two members, Mrs. Simmonds (AMS) and Mrs. Phillips (VAP). The nomenclature and order are according to 'A List of British Plants' by J. E. Dandy (1958), and an alien taxon, i.e. one known or believed to have been introduced by the agency of man, is indicated by *.

A plant of Anagallis minima was found by Mrs. Rhodes on the field excursion to Aldermaston Soke led by Dr. Bowen. Mrs. Simmonds has sent in some interesting information concerning the occurrence of this pimpernel-like member of the Primula family. It is not a new local record. Druce in his 'Flora of Berkshire' notes that it was first recorded in How's 'Phytologia Britannica' (London 1650) as a British species found "near Redding." He adds that it was almost certainly discovered by Mr. Watlington, an apothecary of Reading, since in Ashmole's copy of the 'Phytologia' the locality is given in more precise terms as "upon ye end of ye hill near Chaucer's Coppis, E. A. and J. W." (E. A. refers to E. Ashmole). Druce also records it as occurring near Mortimer (Tufnail); in several localities in the Loddon area including Wellington College and Finchampstead; and in Oxfordshire at Binfield Heath with Radiola (Allseed) in 1872, where it was still in existence in 1885. The most recent Berkshire record until this year was from Frilford in 1945.

This year should see the completion of the gathering-in of records for a revised Berkshire Flora. Records already collected show that many of our less common species are still to be found in the localities described by Druce at the end of the last century. Lesser Antirrhinum, Small Catchfly and Field Stachys were all recorded by Druce as growing at Finchampstead and these species were observed growing in a neglected arable field near Fleet Farm, Finchampstead, in the autumn of 1965.

Members' Records

Berberis vulgaris L. (Barberry) Henley (VAP)

Iberis amara L. (Wild Candytuft) Nr. Aston Tirrold (VAP)

*Hesperis matronalis L. (Dame's Violet) Nr. Harpsden Woods (VAP)

Hypericum pulchrum L. (Slender St. John's Wort) Chobham (VAP)

Silene gallica L. (Small-flowered Catchfly) Fleet Farm,
Finchampstead (AMS)

Spergularia rubra (L.) J. and C. Presl (Sand Spurrey) Top of
Ashley Hill (AMS)

Chenopodium rubrum L. (Red Goosefoot) Nr. Kennet, Reading (VAP)

Radiola linoides Roth (All-seed) Burghfield (VAP)

Geranium rotundifolium L. (Round leaved Geranium) Hambledon (AMS)

Oxalis acetosella L. var. subpurpurascens (Wood Sorrel)
Between Burghfield Common and Mortimer Common. Previously
recorded from Silchester Common, Pamber Forest area, by
Dr. Graveley (AMS)

*Oxalis corniculata L. (Yellow Shamrock) Garden weed, and
spreading outside Reading (AMS)

*Oxalis europaea Jord. (Upright Yellow Sorrel) Garden weed at
42, Alexandra Road, Reading. (VAP)

*Oxalis incarnata L. (Wood Sorrel) Found by C. Hardy on NHS
walk on 2nd April (VAP)

*Impatiens parviflora DC. (Small Balsam) Whiteknights Park (VAP)

Frangula alnus Mill. (Alder Buckthorn) Near Eversley (AMS)

Genista tinctoria L. (Dyer's Greenweed) Fleet Copse, near
Finchampstead (AMS)

*Melilotus alba Medic. (White Melilot) Between Woodley and
Earley on the verge of a newly made road (AMS); Yateley Common
(VAP)

Lotus tenuis Waldst. & Kit. ex Willd. (Slender Birdsfoot-trefoil)
Chobham (VAP)

*Tetragonolobus maritimus (L.) Roth (Dragon's tooth) Henley (VAP)

*Galega officinalis L. (Goat's Rue) Between King's Meadow and
railway line - a garden escape, becoming established (AMS)

*Coronilla varia L. (Crown Vetch) Well established in an old
chalk pit, Henley Road (AMS)

Filipendula vulgaris Moench (Dropwort) Nr. Aston Tirrold (VAP)

*Amelanchier confusa Hyland (June-berry or Snowy Mespilus)
Ashley Hill (AMS)

Sorbus torminalis (L.) Crantz (Wild Service Tree) Ashley Hill
(AMS)

Drosera intermedia Hayne (Long-leaved Sundew) Chobham (VAP)

Daphne laureola L. (Spurge Laurel) Between Medmenham and
Hambledon (AMS); Whitchurch and Ashley Hill (VAP)

Thesium humifusum DC. (Bastard Toadflax) Nr. Aston Tirrold (VAP)

Conium maculatum L. (Hemlock) Kendrick Hill, Reading (AMS)

Apium inundatum (L.) Reichb. f. (Marshwort) Burghfield (VAP)

Sison amomum L. (Stone Parsley) Tilehurst, Little Heath (AMS)

Euphorbia exigua L. (Dwarf Spurge) Found in stubble off Nunhide
Lane (VAP)

Polygonum amphibium L. (Amphibious Bistort) Nr. Kennet, Reading
(VAP)

Vaccinium myrtillus L. (Whortleberry or Bilberry) Found on NHS
walk, Aldermaston Soke (VAP)

Monotropa hypopitys L. (Yellow Bird's-nest) Yateley Common (VAP)

Hottonia palustris L. (Water Violet) Off the Basingstoke Road,
Reading (VAP)

Lysimachia nemorum L. (Yellow Pimpernel) Ashley Hill (AMS);
on NHS walk, Bradfield (VAP)

Lysimachia nummularia L. (Creeping Jenny) Ashley Hill (AMS)

Anagallis minima (L.) E. H. L. Krause (Chaffweed) Found on NHS
walk, Aldermaston Soke (AMS) (See note in introduction to
this Report).

Vinca minor L. (Lesser Periwinkle) Found on NHS walk, Bradfield
(VAP)

Cynoglossum officinale L. (Hound's-tongue) Whitchurch (VAP)

*Pentaglottis sempervirens (L.) Tausch (Evergreen Alkanet)
Nr. Winter Hill (AMS); on NHS walk, Bradfield (VAP)

Atropa bella-donna L. (Deadly Night-Shade) Tilehurst Road,
Reading, waste ground. Plant removed as potential danger to
children (AMS); 8 plants in waste land off Bath Road, (VAP)

*Verbascum phlomoides L. (Mullein) A garden escape growing in
old gravel pit on Wokefield Common (AMS)

Veronica anagallis-aquatica L. (Water-Speedwell) Woolhampton
(AMS)

Veronica catenata Pennell (Pink Water-Speedwell) Woolhampton (AMS)

Veronica scutellata L. (Marsh Speedwell) On NHS walk, Aldermaston
Soke (AMS)

Utricularia vulgaris L. (Common Bladderwort) Little John's Farm,
Reading (AMS)

Stachys arvensis (L.) L. (Field Woundwort) Fleet Farm,
Finchampstead (AMS)

Nepeta cataria L. (Catmint) Caversham (AMS)

Plantago lanceolata L. (Ribwort) Woolhampton; plants with
multi-heads and leafy stalks (AMS)

Legousia hybrida (L.) Delarb. (Venus' Looking Glass) Middle
Assendon (AMS); off Nunhide Lane (VAP)

Bidens cernua L. (Nodding Bur-Marigold) Finchampstead Pond (AMS)

*Galinsoga parviflora Cav. (Gallant Soldier) Waste land,
Tilehurst (VAP)

*Galinsoga ciliata (Raf.) Blake (Ragged Soldier) Whiteknights
Park, Reading (VAP)

*Doronicum pardalianches L. (Great Leopard's-bane) Nr. Winter-
bourne (AMS)

*Petasites fragrans (Vill.) C. Presl (Winter Heliotrope)
Nr. the Abbey School, Reading and at Wargrave (VAP)

Pulicaria vulgaris Gaertn. (Lesser Fleabane) Has appeared
annually in garden at 45 Highgrove St., Reading, since being
accidentally introduced in 1963 (AMS)

- Filago minima (Sm.) Pers. (Slender Cudweed) Yateley Common (VAP)
- Solidago virgaurea L. (Golden Rod) Nr. Eversley (AMS)
- Cirsium eriophorum (L.) Scop. (Woolly Thistle) Hemdean Rd.,
Caversham (VAP)
- *Centaurea jacea L. (Brown-rayed Knapweed) Yateley Common (VAP)
- Serratula tinctoria L. (Saw-wort) Chobham (VAP)
- *Cicerbita macrophylla (Willd.) Wallr. (Blue Sowthistle) Roadside,
Remenham Hill (sent to Museum for identification) (AMS)
- Sagittaria sagittifolia L. (Arrow-head) Woolhampton (VAP)
- Butomus umbellatus L. (Flowering Rush) Woolhampton (VAP)
- Hydrocharis morsus-ranae L. (Frogbit) In a ditch at Little
John's Farm, Reading (AMS). Flowering well.
- Polygonatum multiflorum (L.) All. (Solomon's Seal) Aldermaston
Soke (VAP)
- *Allium paradoxum (Bieb.) G. Don (Few-flowered Allium) Accidental
introduction into garden at 45 Highgrove Street, Reading (AMS)
- Leucojum aestivum L. (Loddon Lily or Summer Snowflake) On an
island, Henley (VAP)
- Narcissus pseudonarcissus L. (Wild Daffodil) A few plants
between Burghfield Common and Mortimer Common. Also known to
be at Mann's Farm, Mortimer (AMS)
- Spiranthes spiralis (L.) Chevall. (Autumn Lady's Tresses) Garden
at Peppard (VAP)
- Listera ovata (L.) R. Br. (Twayblade) Spinney, Three Mile Cross
(AMS); Harpsden, nr. Henley (VAP)
- Neottia nidus-avis (L.) Rich. (Bird's-nest Orchid) Wood nr.
Bisham (AMS)
- Gymnadenia conopsea (L.) R. Br. (Fragrant Orchid) Abundant at
Hurley chalk pit (BBONT reserve) (AMS)
- Ophrys insectifera L. (Fly Orchid) Goring Heath (VAP)
- Triglochin palustris L. (Marsh Arrow-grass) Little John's Farm
Reading (A.M.S.).

Orchis ustulata L. (Burnt Tip, Burnt Orchid, Dark-winged Orchid)
Nr. Aston Tirrold (VAP)

Orchis mascula (L.) L. (Early Purple Orchid) Spinney, Three Mile
Cross (AMS)

Dactylorhiza maculata (L.) Vermeul. (Spotted Orchid) Ashley
Hill (VAP)

Anacamptis pyramidalis (L.) Rich. (Pyramidal Orchid) Whitchurch
(VAP)

Scirpus setaceus L. (Bristle Scirpus) Found on NHS walk,
Aldermaston Soke (VAP)

Eleocharis uniglumis (Link) Schult. (One-glumed Spike Rush) Found
on NHS walk, Aldermaston Soke (VAP)

Carex pseudocyperus L. (Cyperus Sedge) Found on NHS walk,
Aldermaston Soke (VAP)

THE RECORDER'S REPORT FOR MAMMALS, REPTILES and AMPHIBIA
1965 - 1966

By H. H. Carter, M.A. B.Sc.

CHIROPTERA

Pipistrellus pipistrellus (Schr.) Pipistrelle

Seen at Sonning Common 6th June and 29th July; one dead at
Hagpits Wood (Sonning Common) 30th July. One near Chalkhouse
Green 8th September. One at Bradfield Southend, 3rd October.

INSECTIVORA

Erinaceus europaeus L. Hedgehog

17 seen dead on roads in Caversham, Emmer Green and Sonning
Common, also at Goring, 17th May; Chazey Heath, 29th June; west
of Newbury, 23rd July; Benson, 27th August; close to the
Berkshire border at Ham (Hungerford), 8th August; west of Wantage,
22nd September.

Sorex araneus L. Common Shrew

Abundant in the district. I have seen or heard it this year at Chalkhouse Green, 16th June; Manor Farm, 11th July; Sonning Common, 2nd July and 11th September; Juniper Valley (Aston Upthorpe) 9-19th May.

CARNIVORA

Meles meles (L.) Badger

One seen by F.G. in Caversham Park, 10.30 p.m. 23rd August. A.M.S. reports that the sett at Whiteknights Park was in use in February; Mr. Mason reports a track-way through his and adjoining gardens in Christchurch Road, running towards Redlands Road, which was presumably made by animals from this sett. His dachshund (German for badger-hound, as the breed was once used for driving badgers from their setts) was most excited. W.A.N.T. saw a baby badger emerge from a sett at the Thames bank of Reading Gasworks on 30th January; this is unusually early, as cubs are normally born in January at the earliest and remain below ground for 8 weeks. C.C.N.H.S. found a dead female weighing 33 lb. in Mongewell Park during September 1965. E.C.H. reports activity at South Lake, Earley, in February. H.M.B. reports a sett in Hogtrough Wood (Aston Upthorpe). B.R.B. reports a sett at Cray House, Harpsden. I have also seen setts in use in Stony Bottom (Peppard Common) and on the borough boundary south of Bishopsland Farm (Emmer Green).

Lutra lutra (L.) Otter

C.D. saw an otter in the Holy Brook between Circuit Lane and the railway bridge on 1st January. (See also under Coypu, below, for possible otter at Woodley).

Mustela erminea L. Stoat

One dead on the Peppard Road, Chalkhouse Green, 11th August.

Mustela nivalis L. Weasel

One seen crossing Marsh Lane (Sonning Eye) 24th March; one dead on Peppard Road at the borough boundary.

Vulpes vulpes (L.) Fox

A young vixen was run over at mid-day in Tilehurst during the latter part of September, 1965. In the same area, a fox invaded C.J.L.'s garden on three occasions during the last week of June, attracted apparently by a Golden Pheasant and other birds kept there.

Fox tracks were seen at Sonning Eye on 19th January; on 18th June I found an earth there in a much overgrown hedge

alongside the wood west of the large gravel pit. There were several runways leading out southwards through the hedge, and trampled areas strewn with feathers of Woodpigeon, a few Rook (probably), one of Pheasant, and a leg of a Hare. Close by was what appeared to be a badger's latrine pit. Approaching the same wood on 16th September from the north, I stopped at a hedge and saw in the field beyond a triangular black object which binoculars showed to be a fox's ear. The animal was lying among weeds at the edge of the field, separated from the wood by a narrow stream. From time to time it raised its head to look about it. Taking advantage of aircraft passing noisily overhead, I crossed the hedge and was able to approach within 20 yards unseen. The fox rose to its feet, but only to investigate a possible mouse a few feet from where it lay. This proved abortive, and only then did the fox turn and see me standing before it. It stared at me for a few moments, moving its head from side to side but unable to get wind of me, and then leapt across the stream. When I reached the spot where it had lain, it was still audible in the undergrowth a few yards away, but when I stood on the stream bank it moved away deeper into the wood. I returned to the gravel pit and walked beside it through the eastern edge of the wood, where there are badger setts, then skirted the south side of the wood to the site of the earth mentioned above. Looking through a gap in the overgrown hedge, I was again face to face with a fox, which lost no time in making itself scarce. This animal seemed a little stouter than the one I had just seen, but my view of it was brief; probably the two were one and the same, for foxes are usually solitary at this time of year. The second sighting was within a few yards of the place where I recorded a fearless fox last year.

On 15th March I found a complete fox skeleton with a few wisps of hair, on which were several ventral scutes (not the cast skin, but the underlying scales) of a snake, close to the badger sett at Green Dean Wood. In such a situation the snake would most probably be an Adder, Vipera berus L. The teeth were those of a young fox, which may have been led by inexperience to treat the snake without due respect, the outcome being fatal to both. I found another fox skeleton close by on 28th March.

ARTIODACTYLA

Dama dama (L.) Fallow Deer

I saw a fawn a few days old in the road north of Crowsley Park on the night of 17th June, about 10 p.m. BST, in the light of my car's headlights. It was unable to get through the fence, but I chased it on foot to a path up which it escaped. The mother was dimly visible on the other side of the fence. B.R.B. saw a buck at Fawley Bottom on 30th June.

Muntiacus muntjak (Zimmermann) x reevesi (Ogilvy) Muntjac

A muntjac shot by Mr. G. Harman at Turville in December 1965 was probably a hybrid between the above two species. The hairs of the back are individually banded red and black, giving a grizzled chestnut effect, shading into foxy red on the rump and upper tail. The sides are a lighter brown, the underparts and inner sides of the legs pale buff, the rump and underside of the tail white.

LAGOMORPHA

Lepus capensis L. Brown Hare

One seen in beeshwood NE of Highmoor, February. Many records from February to July in the fields beside the Peppard Road between Emmer Green and Sonning Common; maximum on 20th April. Several on the Downs surrounding Juniper Valley (Aston Upthorpe) in May. One dead on Bath Road west of Jack's Booth, 6th August; Many dead, about one per mile, on A 417 from Streatley to Wantage, and on Portway beyond Wantage, a few on the road from Chieveley to Lambourn, one on the Sheep Drove north of Lambourn, all on 22nd September.

Oryctolagus cuniculus (L.) Rabbit

Present at Badger sett south of Bishopsland Farm, maximum 6 on 20th April. One at Cutbush Lane, 10th March. One at Cross Farm, 16th March. 16 (Kidmore End). Present at Nuney Green and Green Dean Wood (same area) 28th March. 8 at Badger sett by Hazelmoor Lane (same area) 13th April. One or more in Hogtrough Bottom (Aston Upthorpe) and one juvenile, 9-18th May. One juvenile by A 417 NW of Streatley, one adult dead in same area 28th-29th June. One dead on A 417 near Moulsoford, 22nd September. 2 old and 2 young adults, several young seen by W.P. at Norcot Hill (Tilehurst) 14th July. 2-3 at Stanford Dingley, 20-30 at Hawkrige Farm (Frilsham), one at Watlington, 14th July. Present at Berinshill 29th July. 7 at Clayfield Copse (Emmer Green) 27th May. Many records from west side of Bishopsland Farm (Sonning Common), maximum 6 on 25th April.

RODENTIA

Sciurus carolinensis Gmel. Grey Squirrel

5 records from Sonning Common, 6 from Caversham and Emmer Green, January to October. One at Nuney Green (Kidmore End) 28th March. Seen dead on roads at Calcot 6th August, north of Peppard Common, 27th August, east of Crowmarsh, 3rd September. One found shot south of Watlington Hill, 2nd October. Dreys seen in Bur Wood, and Hagpits Wood (both Sonning Common), New Copse (Gallowstree Common), Stony Bottom (Peppard Common) and Ufton Park.

Myocastor coypus (Molina) Coypu

2 footprints in the garden of Mrs. G. M. Smith, at 4 Campbell Rd., Woodley, reported on 21st January, were thought to be of this species, but in fact were probably those of an Otter with unusual register (superposition of front and hind footmarks).

Rattus norvegicus (Berk.) Brown Rat

Seen crossing Peppard Road near Chalkhouse Green, 16th January and 29th June; also dead on same road, same area, 17th July, 2nd, 5th and 23rd September. One crossing A 417 at Kingstanding Hill, 16th May. Two dead on same road, near Moultsford and Cholsey, 22nd September. One dead on road near Russell's Water (Nettlebed) 2nd. October.

Mus musculus L. House-mouse

One found dead outside Reading Town Hall, 30th June.

Apodemus sylvaticus (L.) Wood-mouse

Several caught in Aston Upthorpe Nature Reserve, 10th-20th May. All were released.

Arvicola terrestris (L.) Water-vole

My records are all from Sonning Eye, where I usually see or hear up to 3 on the north bank of the gravel pit. One very small juvenile was seen dead there on 13th April.

Microtus agrestis (L.) Field-vole

One running along Kennylands Road by Hagpits Wood (Sonning Common) 15th May.

Clethrionomys glareolus (Schr.) Bank-vole

Dead on Peppard Road near Bishopsland Farm 23rd September.

REPTILIA

Vipera berus L. Adder

Remains, probably of this species, at Green Dean Wood; see above under Fox.

Lacerta vivipara Jacquin Lizard

One seen by the chalk pit on Peppard Common, first noticed by R.J.C., 27th August.

Anguis fragilis L. Slow Worm

A pair seen in copula at Aston Upthorpe Nature Reserve by A.M.S. on 15th May. One taken in Tilehurst by Mr. R. A. Hopes and displayed in the Museum.

AMPHIBIA

Bufo bufo (L.) Toad

A female taken on Hill's Meadow, 6th April; now on display in the Museum. One dead in Chiltern Road (Caversham) on 17th July.

Triturus cristatus (Laurenti) Great Crested Newt

A male taken at Ufton Nervet by Mrs. Newman, seen 10th May. A large female (160 mm. long, weight 16.15 gm.) taken in Southcote Manor moat by Michael Parry, 21st February. The largest recorded British female was 162 mm.

Triturus helveticus (Razoumowski) Palmate Newt

Present in the Oval Pond, Ufton Park, but growth evidently very slow; I took there on 21st February an overwintered tadpole, with legs and gills, 37 mm. long and weighing 0.2 gm., a female, not measured, and a male in breeding condition, 61 mm. long including tail filament and weighing 0.85 gm. The average length and weight for adult males are 75.2 mm. and 1.85 gm. Abundant in the pond on Burghfield Common.

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FUNGI AT KINGWOOD COMMON 1945-66

By E. M. Nelmes and L. E. Cobb

A list of the fungi collected and identified at the Society's Forays in 1945-57 appeared in the Reading Naturalist no. 12. Supplementary lists for the years 1960-65 have appeared in the subsequent issues. This year, we present a consolidated list incorporating all the species named in the earlier ones, together with the new records made at the Foray held on 15th October 1966. Whereas the earlier lists were arranged alphabetically, systematic grouping of genera has been adopted for the present one; the order of genera and species remains alphabetical. The general classification is that adopted in the fifth edition of Ainsworth & Bisley's Dictionary of the Fungi (1961). Dr. F. B. Hora has very kindly identified most of the species, and his nomenclature is followed. For the

relevant groups, it conforms with that of Dennis, Orton & Hora in the New Check List of British Agarics and Boleti (1960).

Nearly all the species fell into two classes distinguished by a microscopic character, the spores being outside the cell (basidium) that bears them in Basidiomycetes and within a special cell (ascus) in Ascomycetes. Most Ascomycetes are inconspicuous, but the group includes the comparatively large and sometimes brightly coloured cup-shaped fungi of the genera Peziza and Otidea (operculate cup-fungi), as well as morels, saddle fungi (Helvella), truffles and candle-snuff (Xylaria). The Basidiomycetes include the Tremallales (trembling or jelly fungi), which are gelatinous, the Agaricales, most of which are toadstools or bracket fungi and the Phallales, (stinkhorns), Lycoperdales (puff balls and earth stars), Sclerodermatales (which include earth-balls) and Nidulariales (bird's-nest fungi). The families into which the order Agaricales is divided include the Agaricaceae (gill fungi), in which the hymenium or spore-producing portion is on gills, the Polyporaceae (bracket fungi) and Boletaceae, in both of which it is porous, the Hydniaceae, in which it is spread over spines, the Clavariaceae (club or coral fungi), in which it is smooth and the structure bearing the hymenium (sporophore) is club-shaped or branched and the Thelephoraceae, in which the hymenium is smooth and the substance of the plant thin. Fungi that were described and named when in the vegetative (imperfect) stage are contained in the Fungi Imperfecti. The reproductive (perfect) stage of most is not known and some do not develop one. When it is discovered, the fungus is transferred to the appropriate group.

Notable finds are Clitocybe houghtonii and Phaeolepiota aurea.

ASCOMYCETES

Hypocreales

Hypomyces aurantius
roseus

Nectria cinnabarina

Sphaeriales

Hypoxylon coccineum
rubiginosum

Xylaria hypoxylon
polymorpha

Helotiales

Coryne sarcoides

Leotia lubrica

Pezizales

Bulgaria inquinans

Helvella crispa
lacunosa

Otidea aurantia
aurantiaca

Peziza badia
succosa
vesiculosa

BASIDIOMYCETES

Tremellales

Auricularia auricula-Judae
Calocera cornea
 viscosa
Dacrymyces deliquescens
Tremella mesenterica

Agaricales

Thelephoraceae

Craterellus cornucopioides
Stereum hirsutum
 purpureum
 rugosum
Thelephora laciniata

Clavariaceae

Clavaria amethystina
 cinerea
 corniculata
 cristata
 fusiformis
 fumosa
 inaequalis
 pistillaris
 rugosa
 stricta
 tenuipes
Pistillaria quisquilaris
Sparassis crispa
 crispa laminate
 form

Hydnaceae

Hydnum repandum
 var. rufescens
 repandum (pale
 form)
Irpex obliquus

Polyporaceae

Daedalea quercina
Fomes annosus
Ganoderma applanatum
Grifola sulphurea
Lenzites betulinus
Merulius tremellosus
Polyporus adiposus
 adustus
 betulinus
 caesius
 fragilis
 giganteus
 mollis
 perennis
 schweinitzii
 varius
Polystictus versicolor
Trametes gibbosa
 rubescens

Boletaceae

Boletus badius
 bovinus
 chrysenteron
 edulis
 erythropus
 luridus
 luteus
 piperatus
 pruinatus
 rubellus
 scaber
 subtomentosus
 testaceoscaber
 tridentinus
 variegatus
 versipellis

Strobilomyces floccopus

Agaricaceae

Agaricus (Psalliota)	(Coprinus) disseminatus
campestris	hiascens
silvaticus	micaceus
silvicola	picaceus
xanthodermus	plicatilis
var. meleagris	Cortinarius armillatus
Amanita citrina	alboviolaceus
" var. alba	bolaris
excelsa	calochrous
fulva	delibutus
muscaria	elatior
pantherina	flexipes
phalloides	hemitrichus
rubescens	hinnuleus
Armillaria mellea	multiformis
Asterophora lycoperdoides	pseudosalor
parasitica	semisanguineus
Bolbitius vitellinus	torvus
Cantharellus cibarius	violaceus
cinereus	Crepidotus mollis
tubaeformis	variabilis
Clitocybe clavipes	Cystoderma amianthinum
ditopus	Flammulina velutipes
flaccida	Galerina hypnorum
houghtonii	mutabilis
hydrogramma	Gymnopilus junonius
infundibuliformis	(Pholiota spectabilis)
langei	Hebeloma crustuliniforme
nebularis	longicaudum
odora	mesophaeum
Clitopilus prunulus	sinapizans
Collybia acervata	versipelle
butyracea	Hygrophoropsis aurantiaca
confluens	Hygrophorus cantharellus
dryophila	ceraceus
erythropus	chlorophanus
fusipes	chrysaspis
maoulata	coccineus
peronata	conicus
tuberosa	dichrous
Coprinus atramentarius	eburneus
cinereus	miniatus
comatus	nigrescens
	niveus

- (Hygrophorus) obrusseus
pratensis
unguinus
virginus
- Hypholoma epixanthum
fasciculare
sublateritium
- Inocybe asterospora
geophylla
hirtella
rimosa
- Laccaria amethystea
laccata
- Lacrymaria velutina
- Lactarius blennius
camphoratus
glyciosmus
hepatius
mitissimus
pallidus
piperatus
quietus
rufus
serifluus
subdulcis
tabidus
torminosus
turpis
vellereus
vietus
- Lentinellus cochleatus
- Lepiota castanea
cristata
procera
rhacodes
sistrata
- Lepista nuda
saeva
sordida
- Leptonia sericella
- Lyophyllum loricatum
- Marasmius androsaceus
oreades
- (Marasmius) ramealis
rotula
wynnei
- Melanoleuca melaleuca
- Mycena acicula
adonis
alba
alcalina
ammoniaca
corticola
epipterygia
fibula
filopes
flavo-alba
galericulata
galopus
inclinata
leucogala
olida
polygramma
pura
sanguinolenta
speirea
uracea
- Nolanea papillata
sericea
- Oudemansiella mucida
radicata
- Panaeolus campanulatus
papilionaceus
semiovatus
- Panellus stipticus
- Paxillus involutus
- Phaeolepiota aurea
- Pholiota adiposa
gummosa
muelleri
squarrosa
- Pleurotus ostreatus
- Pluteus cervinus
phlebophorus
salicinus

Psathyrella conopilea	(Tricholoma) lascivum
cotonea	saponaceum
gracilis	sciodes
hydrophila	sulphureum
squamosa	terreum
	virgatum
Psilocybe semilanceata	
Russula adusta	Tricholomopsis platyphylla
aeruginea	rutilans
albonigra	
atropurpurea	Tubaria furfuracea
cyanoxantha	
delica	<u>Phallales</u> (Stinkhorns)
densifolia	Mutinus caninus
fellea	Phallus impudicus
fragilis	
grisea	<u>Lycoperdales</u> (Puff-balls and
lepada	Earthstars)
mairei	Calvatia gigantea
nigricans	
ochroleuca	Lycoperdon coelatum
pectinatoides	echinatum
pulchella	excipuliforme
rosea	gemmatum
sardonica	hyemalis
vesca	perlatum
xerampelina	pyriforme
(and red-stemmed form)	saccatum
Schizophyllum commune	
Stropharia aeruginosa	<u>Sclerodermatales</u>
coronilla	Scleroderma aurantium
semiglobata	verrucosum
squamosa	
Tricholoma aggregatum	<u>Nidulariales</u>
argyraceum	Crucibulum vulgare
cingulatum	
fulvum	

FUNGI IMPERFECTI

Moniliales

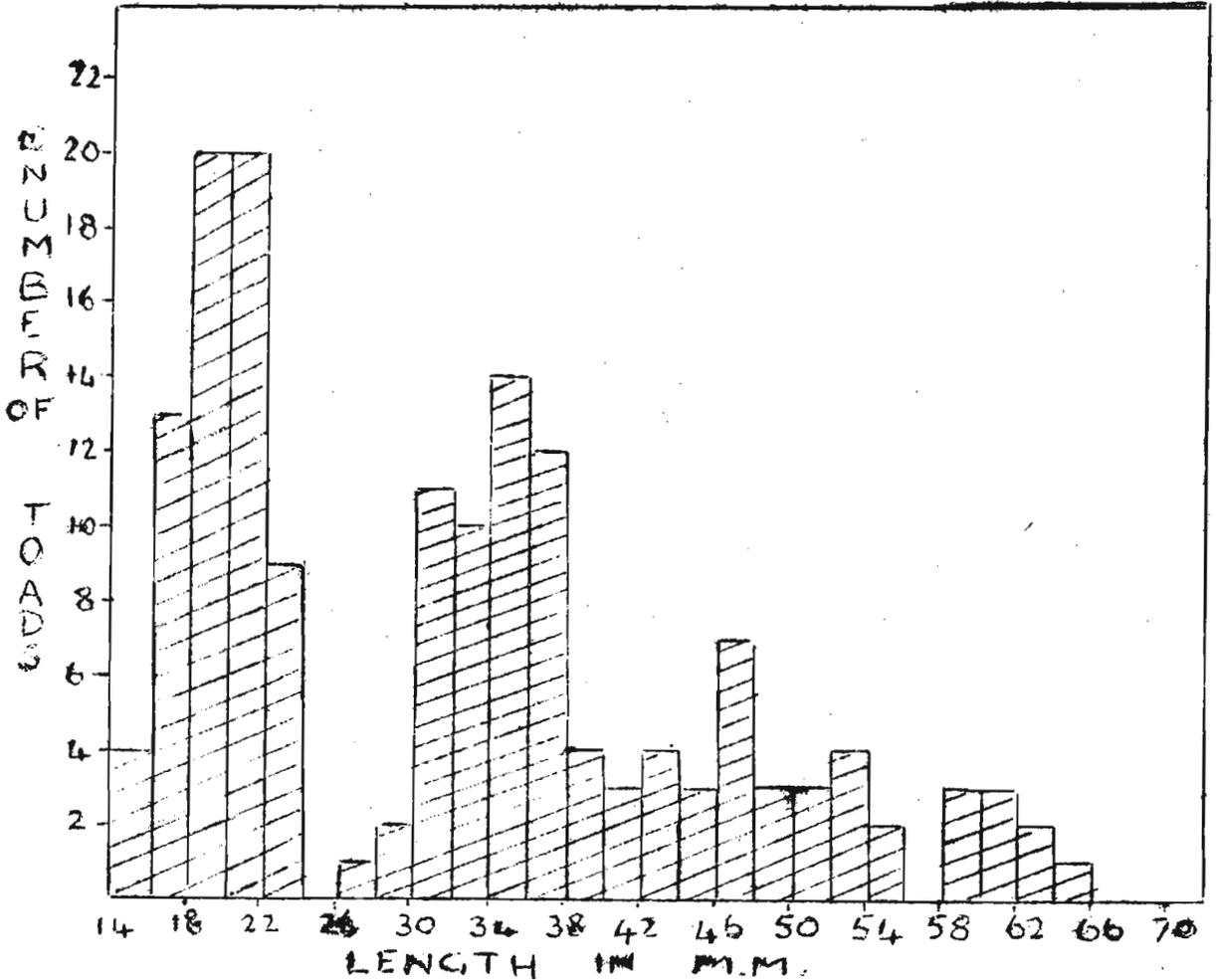
Bispora moniloides

Sepedonium chrysospermum

Trichoderma viride

GENERAL OBSERVATIONS

The immature stages of Bufo bufo (L.)



Between 1st and 8th August 1966, 158 toads were taken in the vicinity of Childs Hall, Whiteknights Park, Reading. The graph above suggests the sizes of first, second and third year toads that may be expected in such a habitat.

This concentration of toads was due to the food available on the disturbed ground and to the great number of sheltering places afforded by the debris and building equipment.

Arthur Price

Destruction of Crocus flowers

In connection with the studies on nipping-off of Pasque-Flower heads at Aston Upthorpe Down, reported on p.21 in this issue, the following observation at Kew Gardens on 12th February 1966 may be of interest. The flowers concerned in this instance were Crocus tomasinianus Herb. or a similar species. A small mammal, which I think was a bank-vole (Clethrionomys glareolus), approached a clump of the flowers, bit one off and disappeared with it behind the trunk of a large tree, which presumably concealed the entrance to its hole from my view. It then repeated the performance until the whole clump of half a dozen blooms had been demolished and carried away at the rate of more than one a minute. I have also seen flowers and parts of flowers of Crocus purpureus Weston deposited at the entrances to the burrows of small rodents in the well-known crocus field at Inkpen Common.

L. E. Cobb

Destruction of Pasque-flower blooms

A plant of the Pasque-flower (Pulsatilla vulgaris Mill.), purchased from a nurseryman and growing in my garden in a western suburb of London, produced a few flower buds in the spring of 1966 but no flowers. Investigation showed that the heads had been nipped off, as happens in the B.B.O.N.T. reserve at Aston Upthorpe, and had disappeared. The plants along the edge of this border are heavily attacked by pigeons, mostly feral but including one or two Wood Pigeons (Columba palumbus), and I had recently seen three feral pigeons standing in a row in front of a plant of Alyssum saxatile L. there and systematically denuding it of shoots. The Pasque-flower grows within a foot of this plant, and I am in no doubt that its buds were also destroyed by pigeons. Greenfinches (Chloris chloris), House Sparrows (Passer domesticus) and Blackbirds (Turdus merula) frequent the garden, but do not come much to the part where the Pasque-flower is. There are no herbivorous mammals.

E. M. Nelmes

The natural history of mammals

For most of this century the study of our wild mammals has been much neglected. There are various reasons for this. The most conspicuous of the land vertebrates are, of course, the birds, and many of us know the joys of just watching them. Being primarily diurnal, as are ourselves, the secrets of their lives are much easier to investigate. Like us, birds are visual

creatures, their sense of sight being of greatest importance. But most mammals, unlike ourselves, are not diurnal and are most active at night; their actions are largely based on information about their environment and fellow creatures gained by their sense of smell, which is a sensory system little used by the primates. It is largely for these reasons, I think, that so much less is known about the natural history of our mammals.

However, over the past ten years things have been changing. The Mammal Society, formed in 1954 and now with a membership of 750, is one indication of this. Very much remains to be discovered - even the distribution of our mammal fauna is very imperfectly known. In order to rectify this, the Mammal Society in collaboration with the British Museum (Natural History), is now operating a National Distribution Scheme. Here, of course, information provided by the local natural history societies is of vital importance. How widely distributed is the Dormouse, for instance? We just don't know. Except for those areas where it has been specifically recorded, we can say little. In Victorian times a Dormouse was a common childhood pet, and must have been relatively abundant, but how many children of today have even seen one? Local records are few. The Museum records one specimen, trapped indoors in Hagley Road, Reading. Another specimen has been reported, found curled up in its nest in a patch of rhubarb at Purley in the autumn of 1965.

M. G. Hardy

Effects of oil pollution on Sticklebacks (*Gasterosteus* spp.)

Berry Brook, which flows from Caversham to the Thames at Shiplake, normally holds a large population of Sticklebacks, mainly *Gasterosteus aculeatus* L. with a few *G. pungitius* L. The stretch immediately below Marsh Lane will usually yield 15 or 20 specimens in half an hour's netting.

On 21st February this year I found the brook heavily polluted with floating oil. In half an hour I was able to find only 4 fish, 3 of them being *G. pungitius*. It appears therefore that this species was not affected, but that virtually all the *G. aculeatus* had died or emigrated.

H. Carter

Plants in Abbey Square, Reading

A rather steep concrete bank in Abbey Square, Reading, constructed 2 - 3 years ago, has been sparsely colonised by the following species of plants. Annuals, biennials and perennials are indicated by the abbreviations A, B and P, respectively.

<u>Sonchus oleraceus</u> L.	A
<u>Conyza canadensis</u> (L.)	A, but young plants apparently over-winter and thus behave as B.
<u>Eupatorium cannabinum</u> L.	P
<u>Epilobium montanum</u> L. and other spp.	P
<u>Festuca rubra</u> L. ?	P
<u>Agrostis stolonifera</u> L.	
<u>Chrysanthemum parthenium</u> (L.)	B or short-lived P.
<u>Senecio squalidus</u> L.	A, but behaving as B or P.

Seedlings of all these species were present in abundance in December 1966, and one wonders how many of them will manage to survive the winter.

The following mosses were also present:

Bryum argenteum Hedw.

Tortula sp.

A. M. Simmonds

ERRATUM The Reading Naturalist No.18.

Page 17. The last sentence should read :
However, it should not be overlooked that some Devon farmers mate their ewes to lamb as early as November.