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THE READING NATURALIST

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The Reading & District Natural History Society

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Editorial

In this number of the Reading Naturalist we have, for the first time, an article on fish, a group of animals that is often neglected by naturalists, but one of which the local species, at least, should henceforth be better known to our readers. The other paper, on the insects of a restricted area, is remarkable for the large number of noteworthy species of different orders with which it deals and the varied information it contains. Unfortunately, it has not been possible to include a botanical article this year, but we are confident that those members who thus appear to have been neglected will find much to please them in both the papers offered and assure them that we shall do our utmost to give them first consideration next year.

We take this opportunity of warmly thanking our contributors, also Mr. Parry, who has again kindly supplied the meteorological data, Mr. W.A. Smallcombe, who has granted facilities for the production of the Journal, and those members of the Museum Staff and others who have so generously given their time to this painstaking work.

In accordance with a suggestion that the Society's activities should be put on permanent record each year, we include a brief summary of the meetings and excursions held during 1955-56.

The Annual General Meeting, the Presidential Address, the Honorary Recorders' Report, and Members' exhibits accounted for four of the eleven winter meetings, and Nature Films were shown by Mr.W.A. Smallcombe at a fifth. The others were devoted to lectures the titles of which included: "Fungi" by Dr.J. Ramsbottom. "Our Chalky Heritage" by Professor P. Allen, "Twins" by Professor C.H. O'Donoghue, "Leeches" by Dr.K.H. Mann, and "The Study of British Mosses" by Dr.E.V. Watson. Mr.D. Grant King was unfortunately unable to deliver his lecture on "Avebury", but kindly lent his slides and notes and Mrs.A. Hasker deputised for him. The average attendance at these meetings was about 20; the Nature Films and the lectures on fungi and mosses were particularly well attended. Bad weather reduced attendance at several of the summer excursions, and the coach trip to Selborne proposed for June 16th was cancelled owing to lack of support. An evening walk proved to be a popular innovation, and more were requested for future years. The excursions and, in brackets, the numbers taking part in them were:-

April 14th, Padworth Gully, for spring flowers (4); April 25th, Pleasure Grounds of Stratfield Saye Park, by kind permission of His Grace the Duke of Wellington (10); May 5th, Swallowfield Park, by kind

invitation of Sir Arthur Russell, for woodland flowers and rare trees (17); May 16th, Emmer Green, evening walk; May 26th, Bucklebury Common to Kiff Green, for spring flowers and birds (13); June 6th, Finchampstead Ridges (5); June 27th, Hazeley Heath, for bog flora (3); July 18th, Downland Walk (Fairmile), for chalk flora (3); July 28th, Woolhampton Marshes, for plants and insects (16); August 8th Remenham, for chalk and river flora (3); August 18th, Aldermaston Gravel Pits, for insects (3); August 29th, Basildon Park, by kind permission of the Hon.E.L. Iliffe, for rare trees, peacocks and golden pheasants (12); September 8th, Fawley, for chalk and wayside flora (11); September 19th, Bearwood, for trees and water birds (2); September 29th, Museum of Rural Life (13); October 13th, Kingwood Common, Fungus Foray (25 - 30).

During July 7th - August 1st the Society held its 75th Anniversary Exhibition, an account of which was given in the previous number.

Honorary Recorders

Botany: Miss K.I. Butler

Entomology: B.R. Baker, B.Sc., A.M.A., F.R.E.S.

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

Ornithology: E.V. Watson, Ph.D.

South Eastern Union of Scientific Societies

The Congress for 1958 is being held in the University of Reading on April 9 - 10 - 11th.

Members of this Society and their friends can attend Congress on payment of the modest sum of 2/6d. As the Reading Natural History Society is acting as host Society for the Congress it is earnestly hoped that all our members will each contribute their 2/6d, and not only take full benefit of the attractive lecture programme (details of which will be circulated as soon as possible) but also help the Congress toward the great success which we hope will be achieved.

Any further information required may be obtained from our Hon. Secretary, Mrs.A. Hasker

STATION - READING UNIVERSITY. HEIGHT ABOVE SEA LEVEL - 148 ft. 1956.

		JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	YEAR
MEAN DAILY TEMPERATURE °F.	MAX.	45.0	37.6	52.3	54.5	65.8	64.5	70.0	65.5	66.1	57.0	48.6	47.2	56.2
	MIN.	33.8	25.6	36.3	37.3	44.7	49.2	54.7	51.0	52.5	43.1	37.4	38.7	42.0
	MEAN	39.4	31.6	44.3	45.9	55.3	56.9	62.3	58.3	59.3	50.1	43.0	42.9	49.1
EXTREME TEMPERATURES °F.	E. MAX.	54	54	63	65	77	75	83	71	78	65	59	56	83
	DATE	1,26,29	28	26,27	10	28	25	26	8,9	24	15	8	6,12	Jul 26
	E.MIN.	27	15	25	30	35	42	49	43	45	34	23	29	15
	DATE	5, 6,13	2,4	12	20	19	14,15	30,31	29	27	26,28	22	22,25	Feb 2, 14
	E. GRASS MIN.	18	10	17	23	22	26	32	35	36	-*	15	21	10
	DATE	25	2	11,16	7	19	15	3	29	27	-	22,23	25	Feb 2
DAYS WITH	FROST	15	23	10	4	0	0	0	0	0	0	5	6	63
" "	GROUND FROST	18	24	18	16	9	6	0	0	0	-	14	8	-
SUNSHINE HRS. (SEED TRIAL) GROUNDS	SUM.	43.9	76.5	132.8	144.9	251.4	146.9	171.5	155.6	96.6	110.1	63.0	9.9	1403.1
	% POSS.	17	27	36	35	52	30	34	34	25	33	24	4	31
	DAILY MEAN	1.42	2.64	4.28	4.83	8.11	4.90	5.53	5.02	3.22	3.55	2.10	0.32	3.83
PRECIPITATION INS.	AMOUNT	3.40	0.24	0.55	1.67	0.20	2.07	2.03	4.57	2.80	1.46	0.62	3.57	23.18
	RAIN DAYS	20	10	9	12	5	17	14	22	13	12	12	19	165
	MAX. RAIN IN 1 DAY	0.71	0.05	0.20	0.63	0.12	0.42	0.71	0.60	0.64	0.49	0.20	0.70	0.71
	DATE	30	6	22	12	9	8	8	30	4	1	8	15	Jan 30 Jul 8
	LONGEST RUN OF CONSECUTIVE RAIN DAYS	7	5	3	3	2	6	3	6	4	4	3	11	11
	LONGEST RUN OF CONSECUTIVE DRY DAYS	5	8	11	6	14	9	7	2	9	7	6	7	14
	SNOW OR SLEET DAYS	4	12	0	1	0	0	0	0	0	0	0	2	19
	DAYS SNOW LYING	0	1	0	0	0	0	0	0	0	0	0	2	3
VISIBILITY	THICK FOG (220 yds)) FOG 220.1100)	5	0	0	0	0	0	0	0	5	6	4	6	26
THUNDERSTORM ACTIVITY	DAYS OF THUNDER	0	0	0	0	0	1	4	3	0	2	0	0	10
	DAYS OF HAIL	0	0	0	0	0	1	0	0	0	0	1	0	2
AVERAGES MEAN DAILY TEMPERATURE °F.	MAX.	45.2	46.3	51.8	56.9	63.7	69.2	72.3	71.5	66.8	58.8	50.2	45.7	58.2
	MIN.	34.3	34.5	36.1	40.1	44.8	50.5	54.1	53.4	49.9	43.8	38.3	36.3	42.9
	MEAN	39.8	40.4	44.0	48.5	54.3	59.9	63.2	62.5	58.3	51.3	44.3	40.5	50.6
PRECIPITATION	AMOUNT	1.9	1.64	1.71	1.46	1.65	1.95	2.03	2.09	1.70	2.98	2.30	2.59	24.0
	RAIN DAYS	15	13	13	12	10	10	12	13	11	15	15	15	153

* = No grass minimum thermometer from 6th onwards.

Weather Records for 1956

Data supplied by M. Parry.

The data refer to Reading University Meteorological Station except those for sunshine, which were recorded at Sutton's Seed Trial Grounds. A "rain day" is a day on which rainfall exceeds only 0.01 ins. The temperature averages refer to the period 1921 - 50 and the rainfall averages to the period 1881 - 1915.

Extracts from the Recorder's Report for Botany 1955-56

By K.I. Butler

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

Cold weather during February and March, 1956 greatly delayed the flowering of early spring plants, and even by April 14th, the occasion of the Society's first Excursion of the year to Padworth Gulley, very few species were seen. As if to atone for their late appearance in the spring, plants flowered late into the autumn, and as many as 243 species were counted on October 24th.

At the Society's Field Meetings during the year, only one or two plants of special interest were noted.

Petroselinum segetum (L) Koch. (Corn Caraway), Aldermaston Gravel Pits, August 18th.

Cirsium eriophorum (L) Scop. (Woolly Thistle), observed again at Basildon Park on August 29th.

Gentiana germanica (Willd), Fawley Bottom, Sept. 8th. This is a local plant of chalk downs in the south, sometimes called 'The Chiltern Gentian', it differs from G. amarella in the large bluish-lilac flowers, and the unequal calyx lobes. Also located at Fawley Bottom were Hypericum montanum L. (Mountain St. John's Wort), and Picris hieracioides L. (Hawkweed Ox-Tongue).

At the Fungus Foray on October 13th, new records for the Kingwood area were -

Crucibulum vulgare (Bird's Nest fungus), Clitocybe flaccida and

Clavaria rugosa.

The year 1956 has been a successful one, not perhaps for the new records made, but for the number of new localities discovered by members for some of the more uncommon species.

Adonis annua L. (Pheasant's Eye), seen by Mrs. Hodgson, J. Hodgson, and the Recorder, growing profusely and flowering on arable downland near Aston Tirrold, on October 20th. Many plants were over a foot in height. Near the same locality was found the rare Papaver hybridum L. (Round Prickly-headed Poppy) which is easily distinguished by its crimson petals, with a blackish spot at the base, and its capsule covered with stiff yellow bristles.

Dianthus armeria L. (Deptford Pink). A new locality found by Mrs. Lamb in a hedgerow at Caversham. This is good news as it has not been seen at Tilehurst, where it was recorded in 1952, since 1954. This Pink is described in Druce's Flora of Berkshire as one of our very local species.

Cerastium arvense L. (Field Mouse-ear Chickweed). Another of our less common species that is being found more frequently. Streatley Hill (J. Hodgson); The Warren, Caversham (I.W. Connell, Reading University).

Melilotus indica (L) All. (Small-flowered Melilot) has appeared as a weed in Mrs. Paul's garden at Peppard, after an absence of four years.

Melilotus alba Desr. (White Melilot). A cornfield near Kingstanding Hill, Berkshire Downs (several members).

Trifolium incarnatum L. (Crimson Clover). Spencer's Wood (Mrs. Paul).

Medicago arabica (L) All. (Spotted Medick). Tilehurst (Mrs. Hodgson); Stoneham School Playing Fields (J. Hodgson).

Lotus tenuis Waldst. and Kit. (Slender Birdsfoot-Trefoil). Remenham Slope (Mrs. Simmonds); Berks. Downs (The Recorder).

Astragalus glycyphyllos L. (Milk Vetch). Still growing by the roadside on the old Bath Road near Twyford (Mrs. Simmonds).

Lathyris aphaca L. (Yellow Vetchling) was recorded by Mr. Douglas in 1954-5 as growing plentifully along a path leading from Moulsford Village to Fair Mile. This year, Mrs. Hodgson found a small amount by a field which is in all probability the end of the path.

Saxifraga granulata L. (Meadow Saxifrage), recorded from Sulham in 1954-5, was growing in great quantity there this year. The Recorder saw many tall plants with flowers just beginning to open in a moist meadow on May 7th. It must have been a lovely sight a week or so later to have seen them in full bloom.

Torilis arvensis (Huds) Link. (Spreading Hedge-parsley), In a cornfield between Waltham St. Lawrence and Ruscombe (Mrs. Simmonds).

Apium inundatum (L) Rchb. (Lesser Celery). This species is more uncommon than A. nodiflorum (L) Lag., but easily overlooked. Gallowstree Common (Mrs. Paul).

Mercurialis annua L. (Annual Dog's Mercury) and Euphorbia lathyrus L .

(Caper Spurge). On a rubbish heap at Thatcham (Mrs. Paul).

Euphorbia virgata Waldst. and Kit. Tilehurst (Mrs. Hodgson).

Hottonia palustris L. (Water Violet). Coleman's Moor (Dr.E.V. Watson)

Gentiana pneumonanthe L. (Marsh Gentian) was visited by several members at Hook Common, and was seen growing plentifully in moist open heathland.

Mentha longifolia (L) Huds. (Horse-mint). Nettlebed (Mrs. Paul).

Calamintha ascendens Jord. (Common Calamint). Sulham (J. Hodgson); field near Henley (Mrs. Paul).

Centaurea solstitialis L. (Star Thistle, St. Barnaby's Thistle) was found by J. Hodgson in a field off the Basingstoke Road, Reading. This very striking annual has not been recorded since 1952, when it was found near Whitchurch.

Allium oleraceum L. (Field Garlic), distinguished from A. Vineale L. (Crow Garlic) by the long points of the spathe bracts. Tilehurst (Mrs. Hodgson).

Orchis simia Lam. (Monkey Orchid) The slope was visited several times during the season, but the Monkey Orchid was not seen, which was disappointing after its re-appearance there in 1955.

Ophrys insectifera L. (Fly Orchid) appeared scarce in its usual haunt, where normally it grows plentifully.

Anacamptis pyramidalis (L) L.C. Rich. (Pyramidal Orchid). Large numbers of very fine specimens were seen at various places.

Desmazeria rigida (L) Tutin (Hard Poa), Tilehurst (J. Hodgson).

Phalaris canariensis L. (Canary Grass). Hill's Meadow (Mrs. Simmonds)

Nardus stricta L. (Mat Grass), which is easily overlooked was found by Mrs. Simmonds on a woodland track at Finchampstead Ridges.

Hordelymus europaeus (L) Harz. (Wood Barley). Near Russel's Water (Mrs. Paul).

Sieglingia decumbens (L) Bernh. (Heath Grass) Hazeley Heath (Mrs. Simmonds); Nettlebed (Mrs. Paul).

One species of the Family Polypodiaceae, Ceterach officinarum D.C

(The Rusty-back Fern) has been recorded from a wall at Peppard Common (Dr. E.V. Watson) and Henley (J. Hodgson).

Equisetum telmateia Ehrh. (Great Horsetail). Nettlebed (Mrs. Paul).

It is very often regretted that owing to the vast system of drainage being carried out in various parts of the country we are gradually losing many wild plants which like damp places in which to grow. It is therefore most satisfactory to know that Mrs. Paul discovered this year a sluggish stream, actually within the borough of Reading, between the railway and river Thames, where the following interesting plants were found:-

Utricularis vulgaris L. (Greater Bladderwort); Hottonia palustris L. (Water Violet); Hydrocharis morsus-ranae L. (Frog-bit); Myriophyllum verticillatum L. (Whorled Water-milfoil); Lemna trisulca L. (Ivy Duckweed); and Carex pseudocyperus L. (Cyperus Sedge)

The Recorder would like to thank all those who have contributed to this Report.

Extracts from the Recorder's Report for Entomology for 1956

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

The Recorder wishes to thank those members and other entomologists in the district who have sent in material for this year's report - particularly as he was unable to make many observations himself during the first six months of the year. Our thanks are due to Mrs. Simmonds, Air Marshal Sir Robert Saundby, Messrs. H.L. Dolton, W.J. Edwards, P.W. Hanney, and R.W. Parfitt, Master John Richards, The Leighton Park Natural History Committee, and Mr. W.A. Smallcombe.

Apart from a run of good weather in late April and May, and again in September, the weather merits no further mention. Insects have consequently been conspicuous by their absence - this particularly applies to immigrants to this country.

The following early dates for insects have been supplied by Leighton Park entomologists and by Mrs. Simmonds:

January 22nd, a Brimstone butterfly (Gonepteryx rhamni.L.) at Burghfield; March 4th, Brimstones out of hibernation, flying on the Berkshire Downs, and 7 Spot Ladybirds (Coccinella septempunctata.L.) observed at Arborfield; March 18th, Small Tortoiseshell butterflies (Aglais urticae.L.) well out at Leighton Park and at Chalkhouse Green, March 26th, Honey Bees (Apis mellifera) active in local gardens, April 2nd, Honey Bees and Humble Bees (Bombus sp.) both present.

Notes on Individual Insect Orders

Hemiptera (Plant Bugs, Water Bugs)

During the past three years a systematic study of water bugs has been carried out by Mr. Hanney with the object of determining the distribution and numbers of different species within the county and of putting forward some suggestions as to why certain species are found in some areas and not in others. The first part of the work is nearly complete and Corixids have been studied from 71 Berkshire ponds covering such varied situations as the top of Inkpen Beacon and the acres of Windsor Great Park. Actual counts of these Corixids have resulted in over 3,000 specimens. Of the known 33 British species, 24 have been found to occur in Berkshire - this is a high figure and may be compared with the number of 23 recorded by the Fresh Water Biological Association at Windermere, where of course many workers have combined to cover their area.

Details of the Berkshire Corixids will be published in one of the entomological journals later on.

Trichoptera (Caddis-flies)

The Berkshire list was published in the Entomologists Monthly Magazine for March 1956 and we made mention of some 78 different species. Donisthorpe has recorded 14 species, mainly from Windsor Great Park, that we have not yet come across and Grensted from Oxford has recorded several others. As Oxfordshire is only on the other side of the Thames from Berkshire, it is more than likely that around 100 species will eventually be in the local list.

D. Elwyn Jones has given me many records of caddis larvae that he has found locally and of these Lype reducta Hag. from the Kennet at Burghfield Bridge, is worthy of special mention, as also is Cyrnus flavidus McLach. from Burghfield gravel pits. Lype does not make the usual type of caddis case but constructs larval tunnels of sand grains and rotten wood held together with silk. By comparison, Cyrnus cases are often fixed in the angle between the stem and leaves of water plants. Radiating out from the cases are large numbers of sticky green filaments which are attached to surrounding objects, the whole resembling the web of a spider. The larva sits in the case until a small crustacean or mosquito larva becomes entangled in the web, when it immediately darts out and seizes its prey before it can get free.

Larvae of Phryganea varia.F. were found in Burghfield Acid Pond on January 22nd. This is quite a local species, and I was somewhat surprised by the finding of an adult at Tilehurst in late July by Mr. Edwards.

I can add two new local records of caddis for Berkshire:

Athripsodes albifrons L., very common to mercury vapour light at Thatcham on 29th August; and Chaetopteryx villosa F., adults common on the river Pang at Tidmarsh on October 15th.

I think it worth mentioning that although caddis adults are often thought of as short lived, a pair of Limnephilus decipiens.Kol. lived for over a month in my room - from October 8th until early November - feeding daily on a diet of sugar and water. During this time the female laid four egg batches with an estimated total of some 650 eggs.

Hymenoptera (Bees, Ants and Wasps)

Mrs.Simmonds has made a note on the nuptial flight of ants. She writes - "the usual date for this event seems to be the end of July or beginning of August - dates recorded in past years range from July 19th to August 4th. Members on the Society's excursion to Fawley Bottom on September 8th were able to observe winged ants leaving a nest. On September 13th there were considerable numbers on the wing at mid-day in the town (Mount Pleasant). In 1948 it was also observed that the flights took place much later".

I also noticed ants swarming later this year whilst on holiday down in Dorset.

A very interesting hymenopteron brought into the Museum last June was Rhyssa persuasoria L., a parasite of the Giant Horntail (Sirex gigas L) whose larva lives within the wood of conifers. How the Rhyssa detects the Horntail larva deep in the pine-trunk is not definitely known, probably smell largely enters into it. In order to lay her egg on the larva the Rhyssa must drill into the trunk and has a most workmanlike ovipositor to carry out the drilling. This thin needle is able to drill a hole 1¼ inches deep into solid wood in less than 20 minutes.

Coleoptera (Beetles)

There are only two notes on this order. The first concerns the familiar Stag Beetle (Lucanus cervus L). Returning from London one evening towards the end of June I saw several of these large beetles flying around the Bullace tree at the bottom of my garden. They looked ungainly creatures as they sailed around the tree and were a pleasant reminder that mid-summer was now upon us.

The other note is a brief one on the weevil Cossonus parallelipipedus Herbst. These were swarming in great numbers over the trunks of Black Poplar trees in Coley Recreation Ground in late June.

Odonata (Dragon-flies)

One record of interest here, that of Orthetrum cancellatum L. (the Black-lined Orthetrum) taken on July 12th at Leighton Park.

Lepidoptera (Butterflies and Moths)

Mr. Dolton has bred out further specimens of microlepidoptera this year - particularly species of Lithocolletis . These are indeed micro-lepidoptera, averaging 7 mm. in wingspan. He mentions specifically L. harrisella L., L. heegeriella.Zell., and L. messaniella Zell from oak; L. Coryli von Nic from hazel; L. spinicolella Zell from blackthorn; and Lithocolletis blancardella F. from apple. The mines of all these species were collected during the autumn of 1955. Recently Mr. Dolton has taken eight mines of blancardella from a four-year old apple tree in his garden.

Mr. Parfitt also specialises in microlepidoptera and he has made special mention of the following uncommon species:
Phalonia dipoltella Hb., from Farnborough on July 17th (this is stated in

the books to be mainly a coastal species); Chrysoclista linneella Clerck on 2nd July, from the lime trees in Forbury Road; Mompha fulvescens Haw on 11th and 12th July at Crowthorne; and Lithocolletis comparella Dup a reputedly scarce species which Mr. Parfitt has bred out from white poplar.

Among the macrolepidoptera, Mr. Parfitt recorded Freyer's Pug (Eupithecia egenaria H.S.(arceuthata Frey)) on June 20th from Farnborough; this is a good species, found on Juniper and Cypress trees and could well occur closer to us than Farnborough.

John Richards found Fox moths (Macrothylacia rubi L) in some numbers on Streatley Hill in May, and records the Silver-spotted Skipper (Hesperia comma L) butterfly from the same locality in August. He tells me that at Pamber Forest both Silver-washed and High-brown Fritillaries (Argynnis paphia L. and A. cydippe L) were abundant in late July, and that in August they were lucky to take the beautiful dark form of the Silver-washed Fritillary known as valezina. At the same time a Purple Emperor (Apatura iris L) tantalisingly flew overhead at Pamber but continued to keep well out of reach of the net. From Hardwick there is news that the colony of Chalkhill Blues (Lysandra coridon.Poda) continues to flourish and that the butterflies give a good percentage of varieties.

It is very interesting that two such woodland butterflies as the White Admiral (Limenitis camilla L) and Silver-washed Fritillary have both been observed at Leighton Park, and I have further looked through the School's list of lepidoptera compiled by Christopher Watson and have been impressed by the imposing list of species recorded from that area.

On our Society's excursion to Swallowfield Park on May 5th, Orange Tip (Euchloe cardamines L), Speckled Wood (Pararge aegeria L), and Peacock (Nymphalis io L) were observed, and on July 18th, when members visited the Berkshire Downs, the Marbled Whites (Agapetes galathea L) were well out.

From the excursion to Remenham on August 8th, Mrs. Simmonds brought back several larvae of the Striped Lychnis moth (Cucullia lychnitis Ramb). These were kept on show at the Museum and pupated successfully in mid-August.

From my own notes I can record the Butterbur moth (Hydraecia petasites Doubl) from the Kennet near Newbury. This moth was mentioned in the Victoria County History, 1906, as rare in Berkshire, but I am sure it is not so much a case of rarity as getting to know the habits of the creature. From the butterbur roots it was found possible to dig up the pupae, though this proved to be a rather tedious business. The moth itself flies for only a very short period at dusk and is not readily attracted to light, but a visit to the locality on a beautiful drizzly night in August certainly proved that the Butterbur moth is to be found if really searched for.

The general picture for the season for lepidoptera is however one

of scarcity. As Mr. Dolton remarked in his note to me, even the White Butterflies have been few in number. Even so, there are one or two species that have not conformed to the general pattern, and Sir Robert Saundby records that the Suspected moth (Parastichtis suspecta Hb), and the Garden Dart (Euxoa nigricans L) were present at Burghclere in higher numbers than usual.

Two immigrant moths of some note have also braved the weather and visited our shores. My first news of the immigration was obtained firsthand between midnight and 1 a.m. on Studland Sand Dunes, Dorset, when both Death's-head (Acherontia atropos L), and Convolvulus Hawkmoth (Herse convolvuli L) came to mercury vapour light. This was in early September. Back in Reading later in the month, I learnt from Mr. Smallcombe that a Death's-head was taken at Calcot - this specimen flew into a boy's face and was brought into the Museum on the following day, surprisingly enough in quite good condition.

Autumnal butterflies increased somewhat in numbers, Small Tortoiseshells (Aglais urticae L), Commas (Polygonia c-album L) decorated our michaelmas daisies and buddleias, and Red Admirals (Vanessa atalanta L) were seen enjoying fallen fruit during September. The last Small Tortoiseshell flying in my garden was seen on November 7th.

Extracts from the Recorder's Report for Ornithology

(November 1955 - November 1956)

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

The Recorder stresses that the observations that have come to his notice represent only a very small fraction of what in fact occurred among the birds of the Reading district during the year under review.

1. Winter Gulls There is little to report. It was remarked that on February 19th some mottled and some "all-white" Black-headed Gulls still retained the dull salmon, black-tipped bill. Mrs. Simmonds has referred to the "return of the gulls" on October 30th, and the Recorder urges members to keep a look out for the numbers of Herring Gulls, which are subject to much fluctuation. He himself noted the Lesser Black-backed Gull (which is more of a passage migrant) in the months of April, May, September, October and November 1956.

2. Winter Duck Some records for late autumn and early winter 1955 we owe to Messrs J.E.G. Sutton and C.E. Bignal. These, already noted in the Reading Ornithological Club's Report for 1955, include a fine range of species at Sonning Eye gravel pit: 50 Wigeon on November 20th, 62 Pochard on December 27th, one male Goldeneye on December 16th, one female Smew on the same date ond one female Goosander during November and December. At Bearwood on November 27th, the Recorder saw some 25 Wigeon. Mr.K.E.L. Simmons recorded the usual species at Burghfield gravel pit during the winter months. A Smew was there in early March and the number of Wigeon reached 40 on March 4th. In the early winter period of 1956, no specially unusual duck came to the notice of the Recorder, but Pochard and Tufted Duck were present at Burghfield on November 4th, Tufted Duck, Mallard and Shoveler at Aldermaston on November 8th, whilst one Pochard, several Tufted Duck and some 150 Mallard were seen at Sonning Eye on November 11th.

3. Winter Finches, etc. The winter under review was notable for observations of Brambling and Siskins. Dr. C.C. Balch had a flock of up to 300 Brambling under observation at Finchampstead in the early months of 1956. Mrs. G.W. Tucker saw about 100 Siskins by the Loddon at Stratfieldsaye on December 11th, and Mrs. J.L. Fox saw one at Bearwood on December 25th. The Recorder met with a flock of about 20 Siskins in pine trees at Mortimer Pickling Yard on March 18th, where they were consorting with Goldfinches. Bullfinches were widely reported in the press as doing particularly serious damage in many places during the early months of 1956. On February 15th, the Recorder saw six together in Caversham Lower Warren.

4. Spring Arrival of Migrants The following arrivals were noted: April 2nd, Chiffchaff, Mrs. Simmonds; April 14th, Willow Warbler and Cuckoo at Padworth, Mrs. Simmonds; April 17th, Blackcap and Common Whitethroat at Sonning Eye, the Recorder; April 27th, Nightingale, Eldon Sq., Mrs. Hasker; May 2nd, Yellow Wagtail and Sedge Warbler at Sonning Eye, the Recorder; May4th, -- almost the first really warm sunny day with wind

from the west - a Swift appeared over Ilkley Rd., Caversham, during the evening; May 5th, Turtle Dove, Sonning Eye; May 6th, Swifts reported by Mr. Fishlock and by Mrs. Simmonds; May 12th, Garden Warbler, Sonning Eye. Observations were scanty, especially during early April, but even when allowance was made for this, 1956 was a "late" year on the whole.

5. Spring Passage of Waders and Terns

There is nothing to report under this head.

6. Breeding Records

Mr.B.T. Parsons reported the breeding of Red-backed Shrike at Maiden Erleigh, and the Recorder had evidence of the birds at Kidmore Road, Caversham, although it is not known whether they stayed to breed. A fine male was seen at this site on June 6th. Little Ringed Plover nested in two places in the district. Tufted Duck bred at Burghfield gravel pit for the first time. Mr.P. Hanney recorded pairs of Canada Geese, each with three young, on June 26th at Aldermaston, on July 12th at Sonning, and during July at Longmoor. He also recorded nests of Kingfisher (with young) and Little Grebe (eggs and young) at Woolhampton on August 6th. Mrs. Simmonds found little activity at the Coley Park Heronry on February 26th, perhaps attributable to cold, but observed an increase in the number of nests from 13 to 17. Miss.K.I. Butler, Miss.D. Mason and Miss A.J. Towns found two pairs of Stone Curlew at the locality by the Fair Mile on May 3rd. They also had the good fortune to see a Hobby. It is to be regretted that there were no Wrynecks nesting at Caversham in 1956.

7. Departure of Regular Summer Visitors

Only three specific "last dates" are available; August 9th, Swift, Mr. Fishlock; September 19th, Spotted Flycatcher, and September 26th, Yellow Wagtail, both by the Recorder. Miss Mason had a November record of Swallows from the South Coast.

8. Autumn Passage of Waders and Terns

Most of the records under this head came from Mr. Hanney, who observed Common Sandpiper at Aldermaston gravel pit on July 8th and 15th and the Green Sandpiper at the same place on the latter date. The same observer reported a Ringed Plover, found dead by the Grenadier, Burghfield, by Mr. Gillings of Allan Dene, Three Mile Cross, on November 9th 1955. The bird was brought into the Museum. Mr. Simmons recorded seven Curlew over Burghfield gravel pit on August 4th. Records of autumn terns were not numerous, and referred only to Common (or possibly Arctic) terns. One oiled bird was present at Burghfield gravel pit from July 1st till August 6th, whilst another individual was reported by Mr. Hanney from Sonning Eye on July 12th.

9. Various Passage Movements: Rare Visitors, etc.

Perhaps the November Ringed Plover already mentioned and the Water Rail seen at Bearwood by Mr. Fox in early spring find a place in this section of the Report. The Pied Flycatcher seen by Mr. Parsons in Prospect Park in April was a notable visitor to the Reading district, although it is not uncommon in certain parts of west and north Britain. Of exceptional interest was the report received from Mr. Simmons of a most unusual wagtail seen at Manor Farm from April 17th to 20th, among at least 20 male Yellow Wagtails. The head was predominantly a uniform pale grey and the bird was considered to be referable to the race known as Sykes's Wagtail. Among less exciting passage records may be mentioned the occurrence of a male Whinchat at Manor Farm on April 25th (Mr. Simmons) and the rather remarkable appearance of a large Wheatear (probably referable to the Greenland race) in Ilkley Road on the misty morning of May 5th, when it was seen by the Recorder before it flew away over the housetops. Autumn passage, among small Passerines, showed itself in the form of one Wheatear and two Whinchats in arable fields at Burghfield on September 19th and a female Redstart in waste land, Kidmore Road, Caversham, on September 23rd.

10. Miscellaneous Notes

1. Several observers recorded Fieldfares and Redwings drawn to the vicinity of town gardens during the hard weather of February.

2. "Overlooked" species, of which few or no records came in, include the Hawfinch, and also the Lesser Spotted Woodpecker, of which the Recorder saw something at the University Athletic Ground during May. Also notable in this context was the Tree Sparrow (records by Mr. Sutton at Manor Farm, December 21st, and by the Recorder at Sonning Eye in early May) and the Willow Tit, which one tends to hear in many places once the call-note is known and which is certainly commoner than many people suspect.

3. Observations of bird behaviour by the Recorder included a curious variant of the song of the Whitethroat, heard on April 17th, which was more subdued, more varied in note quality and of longer duration of phrase than usual; the drumming of a Greater Spotted Woodpecker on a telegraph pole, the "drum" being repeated at intervals of 15 seconds; and a very persistent Robin that built a nest and reared young successfully on a bookshelf in the private room of a lecturer of the University of Reading.

Some of the Interesting Insects of the Burghfield Area

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

Even as far back as 1834 the woods and commons of the Burghfield area were well known to field naturalists. The Rector of Burghfield, the Rev.C. S. Bird, writing at that time, has left us a delightful account of early entomological practices, and his observations are perpetuated in P.B.M. Allan's fascinating book "A Moth Hunter's Gossip".

Today, the Burghfield area is still a favoured one with naturalists - a place where one can observe a pageant of wild life. Insects, Amphibians, Reptiles and Birds all have their particular niches over these heathy tracts, but it is with the first group that this paper is largely connected.

The geological make-up of the area, predominantly plateau gravels, gives rise to country of pine, birch and heather, with, here and there oak and mixed woodland present in association with the underlying London Clay.

Certain of the insects inhabiting this type of country are worthy of special mention, and it might be appropriate to commence with the Kentish Glory moth (Endromis versicolora.L), an insect for which Burghfield was formerly famous. This beautiful moth disappeared from the local heaths about 1919, but the keen lepidopterist of today will still find, in the latest edition of Richard South's "Moths of the British Isles", the "Reading district of Berkshire" quoted as a favoured locality. The answer to the question "Why did the Kentish Glory disappear from Burghfield ?" cannot be given with any certainty, for this was not the only area in the south of England to lose the moth. Rather than place the blame on collectors, it seems more likely that a widespread climatic change so influenced the physiology of the species that it practically ceased to exist all over the south of England. The moth also occurred, and indeed still does, in Wyre Forest, Shropshire, in many places in the north of England and, most frequently of all, in Scotland. Protection seems to have been afforded the Kentish Glory at Burghfield for, as Allan relates he was once confronted by a gamekeeper and asked if he had a permit to collect the moth. The keeper was acting for a Mr. Palmer (said to own the Common) and he showed Allan an official permit - a rather soiled piece of paper, on which was written "Permit Mr....., to catch 2 Kentish Glory moths" and this was dated and signed by the landowner. Allan was able to take his moths, for, as he reasoned he was operating on the roadway, and was therefore immune from the landowner's attention. He was, in fact, what is commonly known as "sembling" the moth, which is, simply, taking a captive, virgin, female moth to a favoured locality and thereby attracting the males to her. Providing the female is isolated in a small muslin cage, males will continue to arrive (under favourable weather conditions) in some numbers.

Although an expedition to Burghfield today will not reward the visitor with the sight of Kentish Glory moths assembling, the process may equally

well be tried with the Emperor moth (Saturnia pavonia.L.), whose habits are very similar.

All female moths must assemble - each species having its own particular time of day or night when this is undertaken. Often it takes place at dusk or dawn, but as we shall see, there are exceptions to this generalisation.

The Emperor moth is common on our heaths and the visitor to Burghfield on any fine afternoon in mid April will soon see the males dashing about madly over the heather. The moths are obviously busy about their business - the important business of assembling - and they appear to let little stand in their way. We have had male Emperors frantically crawling about our persons - a dozen or more at a sitting - all obsessed with the task of successful pairing with the captive female that we had brought along. They take not the slightest notice of mere humans !

How do these persistent suitors know where to pursue their courting ?. The means of attraction between Emperor moths, and indeed between over fifty other species, has been studied by Dr.H.B.D. Kettlewell, and he has lucidly collated the known facts.

The process commences with the female moth emitting a scent from a gland situated at the tip of the abdomen, and the substance producing it, probably a highly volatile oil, becomes air-borne. As two different species may use the same scent stimulus it is of the greatest importance that the optimum time for assembling should differ in these species.

Our female Emperor may then be envisaged, clinging to a heather stem, and emitting the scent stimulus. Now, it is known that many moths choose dusk or dawn to assemble because at this time there is a layer of cool air immediately on the surface of the earth. There is an analogy here with the release time for a poison gas attack-the optimum conditions for such an attack, so we were informed, is indeed at dusk or dawn, for at these times there would be little loss of the gas due to convection currents. In hot sun such a gas attack is said to be useless, Yet our Emperor releases her gas equivalent quite happily on warm, sunny spring afternoons and appears to have little cause for anxiety as to the effectiveness of her "attack". Obviously there must be great wastage of the scent due to convection currents, and, equally obvious, the male must possess some extremely delicate mechanism for picking up the remaining molecules of rapidly disseminated scent.

The agreed sites of reception in male moths are the antennae, and the Emperor, assembling as it does in sunshine, is possessed of very large antennae, feathery in shape and thereby forming a large receptive area. Complete amputation of both antennae leaves the male incapable of assembling, whereas loss of one antenna prevents him from perceiving direction. It appears that by balancing the number of scent molecules striking each antenna per second, and by turning in the direction of increased concentration, the male is enabled to track down the female.

It can easily be envisaged that the male approaching up-wind will, should he overshoot the position of the female, land himself in a negative, or dead, zone, where the scent, due to the air currents will be absent. He must then wheel round and make a fresh approach - the actual behaviour varying in different species. Dr. Kettlewell's excellent paper, quoted in the list of references, is well worth reading for fuller details of this fascinating process of assembling.

Before leaving the moths of Burghfield, mention might be made of one further species - a relative newcomer to Berkshire, and one which would have delighted the eyes of such indefatigable workers as our former members W. Holland and W.E. Butler.

The Pine Hawk-moth (Hyloicus pinastri.L) was, until the late 1930's known only in this country from Dorset and Suffolk. A gradual spread from the former county then took place northwards up through the New Forest, and in 1944 I had the great pleasure of finding the first recorded Pine Hawks known from our district. A pair of these striking moths were sitting on a telegraph pole a few yards south of the Berks/Hants border at Burghfield. Defeated by these few yards we had to wait until 1945 to record authentic Berkshire specimens.

Since 1944 the moth has spread northwards and eastwards, but Burghfield remains one of its most favoured localities. Proof of its establishment at Burghfield was forthcoming during the winter of 1947/8 when a systematic dig around the trunks of a large number of pine trees brought to light several of the distinctive, large, reddish pupae a few inches below ground level. Indeed, the Pine Hawk has well and truly 'dug itself into' Berkshire and now it forms a welcome addition to the local lepidoptera list.

Burghfield has within its bounds some interesting ponds which support populations of several species of dragon-fly. A number of these have been studied by Dr. Corbet, particularly at the celebrated 'fishpond' on the Common, and the relevant papers are given in the list of references. This particular pond, situated, as it is, partly on gravel and partly on clay, is a highly productive locality for dragon-flies. It forms a breeding site for the largest British species, the Emperor dragon-fly (Anax imperator. Leach) which may be seen hawking over the water and surrounding common from late May to early August. If a visit to the pond can be made early in the day - in other words just before dawn - then the visitor will be well rewarded by the sight of numbers of these beautiful insects newly emerged, drying their wings prior to maiden flight. Thin-bodied dragon-flies (damsel flies) emerge at a more respectable hour - the Large Red Damsel-fly, which also breeds in this pond, has its peak emergence time between 9 and 10.a.m. Thicker-bodied dragon-flies, such as the Emperor, take longer to harden than the delicate damsel-flies, and emergence generally takes place at night to prevent predation by birds.

The trees and bushes in the neighbourhood of the pond provide shelter for many adult insects who have spent their larval existence below water.

Many caddis-fly adults, for instance, shelter by day among the needles of the smaller pines and may be readily tapped out into a beating tray. By the same technique of beating, two of our three native species of cockroach may be found as they become disturbed from their hiding places at the bases of thick clumps of heather.

Higher up on the heather one frequently finds the exquisite little mud nest of the Heath Potter Wasp (Eumenes coarctata.L). These tiny earthen pots often complete with neck and rim, are the work of the female wasp, who then provisions the nest with several very small caterpillars. Having provided this store of fresh food she then suspends a single egg from a delicate filament and the nest is sealed. On hatching, the wasp grub, still hanging on to its suspensory filament, takes its first meal of caterpillar. This unusual feeding attitude would appear to protect the grub from being crushed by its much larger caterpillar victims, and allow it to reach a size at which it can venture down among them.

The commons of Burghfield are populated with a host of other interesting insects - we have had time to talk over only a few of them.

The Burghfield of today, changed though it must be from the time of the Rev. Bird mentioned in our opening paragraph, is still a fascinating place to have so close on hand to those of us who live in Reading. Indeed one feels a very close link with that reverend gentleman sitting in his study, and by the light of his Sinumbra lamp writing - "I have for experiment's sake, sat up in the summer 'till 3 o'clock, when the whole heaven was bright with the rising sun, and moths of various kinds have never ceased arriving in succession 'till that time".

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On the Local Freshwater Fishes

by C.J. Leeke, B.Sc.

Introduction

The term "fish" is taken to mean only those aquatic vertebrates which breathe by gills and possess fins for locomotion. This excludes all the invertebrate animals to which the term "fish" is loosely applied, such as jellyfish, shellfish, cuttlefish, crawfish, crayfish and starfish.

The fishes are an important group because not only do they include the largest class of vertebrates but also the oldest class. Thus the first vertebrates were fishes, known by fragmentary fossils from Ordovician deposits, possibly more than 400,000,000 years old and by complete fossils from Silurian deposits, some 300,000,000 years old, that showed them to be jawless.

These original, jawless fishes, of the class Agnatha, gave rise to all the subsequent fishes both extinct and living and also to all the Amphibians, Reptiles, Birds and Mammals.

The following chart will show at once the relationship between the vertebrate classes and the importance of the fishes. It must be stated, however, that all the details of the origin of the classes are not known, but that sufficient evidence is available to indicate strongly the sources and approximate dates. (see chart on page 23).

The classification of fishes is difficult and different writers attach varying degrees of importance to the larger groups. The simple classification, used by A.S. Romer in "The Vertebrate Body", is followed here.

The four classes of fishes are worth a brief review, so that the local fishes may be seen in the context of their ancestry and their relationship to other fishes.

Class I Agnatha

The group, which began with the original vertebrates, is still represented by living members. The living, jawless, round-mouthed fishes, collectively called the cyclostomes, are now specialised for a parasitic existence. Originally, it is believed that the group were filter feeders as indeed are the larvae of the living lampreys and hagfishes. They have no scales, no paired fins and the six, or more, pairs of gills have separate openings. Internally they differ markedly from other fishes.

Class II Placodermi

These were the first fishes to evolve jaws, an important development, which enabled them to enjoy a diet of sizeable animals that they could catch and bite up. Although the group itself is not known to have survived beyond the Permian, its descendents were provided with an impetus towards a development of and selection for better sensory organs and thence better brains.

Class III Chondrichthyes

This group comprises all the sharks, rays, sawfishes and dogfishes. The skeleton is cartilaginous, a condition which is believed now to be secondary and not primitive. There are five to seven pairs of gills usually with separate openings and a functional spiracle, used, particularaly by rays, as a respiratory intake to avoid taking sand from the bottom. The fins are fleshy,, supported by cartilaginous structures. Most members of the class are marine, none occur in British freshwaters.

Class IV Osteichthyes

The bony fishes, the largest class of vertebrates. A very important group becuase it was in this group that simple lungs first developed, from which swim bladders evolved and also the complex lungs of the terrestrial vertebrates developed. Early in the history of the class, it divided into two lines:

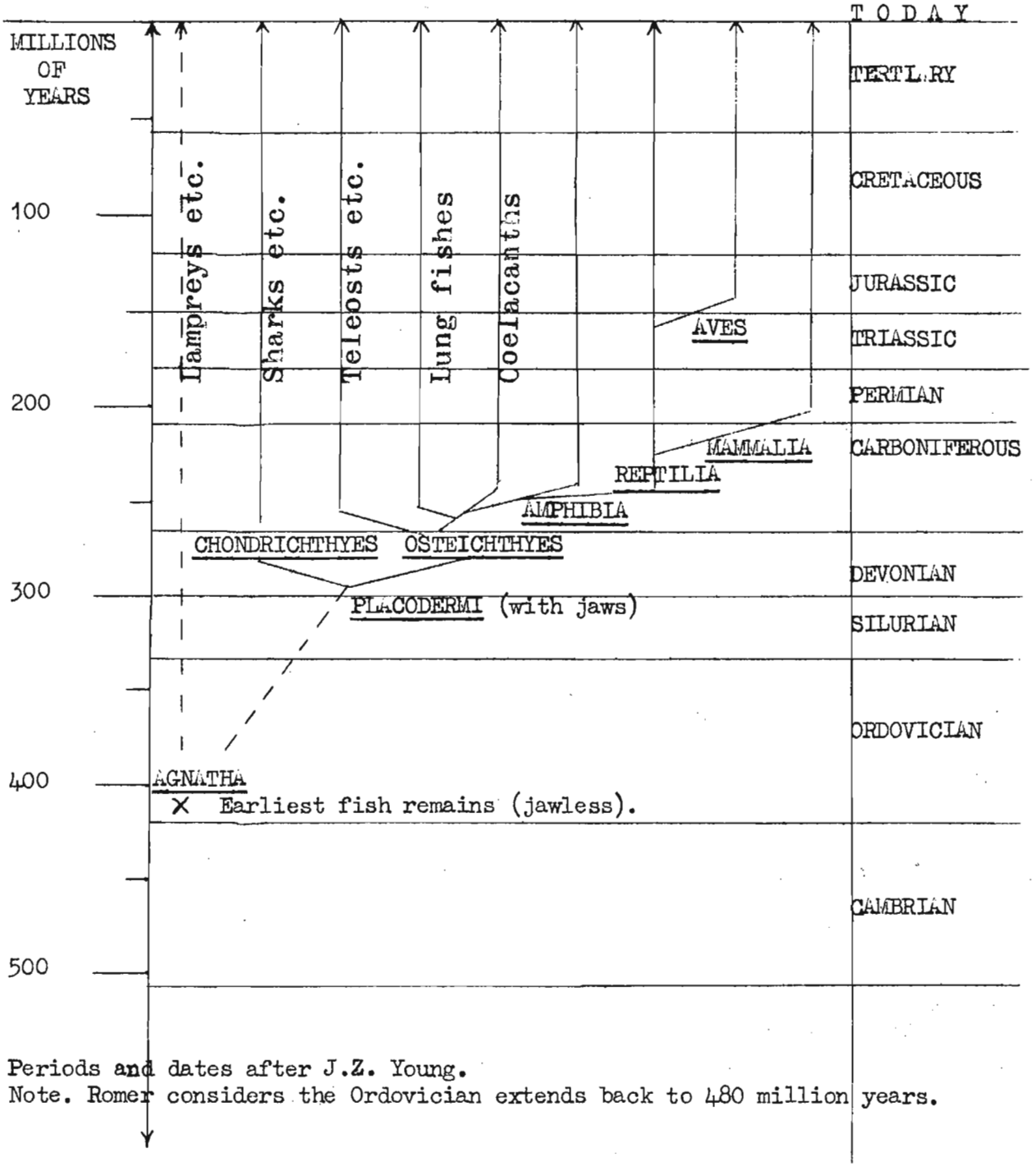
(a) the Actinopterygii an enormous group containing the bulk of the bony fishes and all except one species of our local fishes. The name means "ray-finned fishes" the fins being supported on bony rays or spines and consisting of a web of skin.

(b) the Choanichthyes comprising the lung fishes (Dipnoi), coelacanths and other extinct forms. This group not only has members with lungs, but also with paired fins on short limbs or lobes, just the structures necessary for the development of land-going vertebrates. In fact the first amphibians evolved from the basal stock either in the late Devonian or early Carboniferous.

All of the Osteichthyes have 4 pairs of gills opening under an operculum and swim bladders or lungs, unless these have been lost secondarily. In the chart on page 24 showing the relationship between the various groups of the Class Osteichthyes, the words 'palaeoniscoid', 'ganoid', 'cycloid' and 'ctenoid' refer to the type of scale found on the fishes of that particular group.

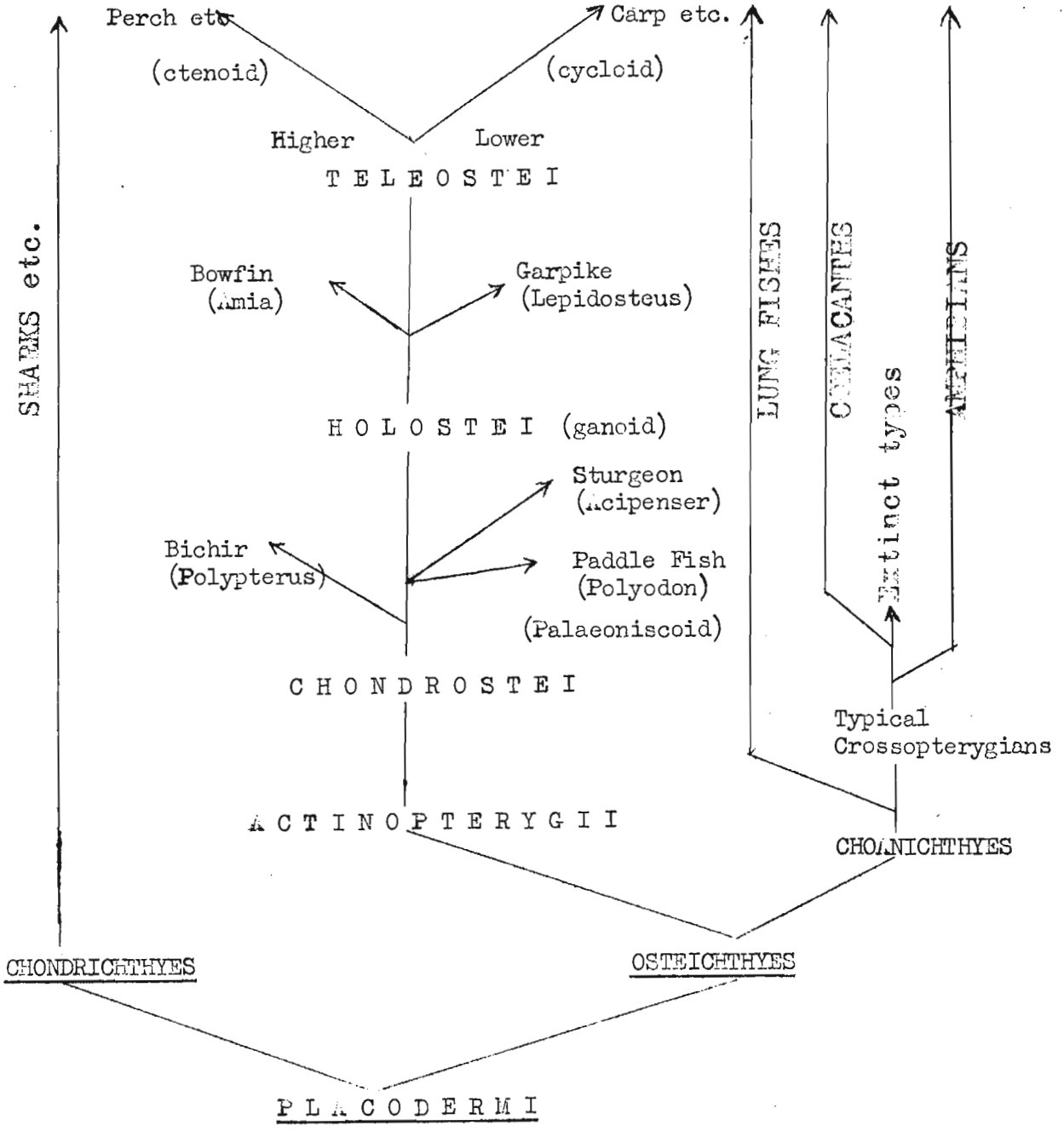
The cycloid and ctenoid scales of the teleosts are similar in being extremely thin and overlapping but differ in shape, the former being rounded whilst the latter have "teeth" and are thus comb-like. Palaeoniscoid and ganoid scales are usually thick and do not overlap.

CHART SHOWING RELATIONSHIP BETWEEN THE VERTEBRATE CLASSES



Periods and dates after J.Z. Young.
Note. Romer considers the Ordovician extends back to 480 million years.

CHART SHOWING THE RELATIONSHIP OF THE GROUPS
of the BONY FISHES



(Chart modified from
Romer)

The Local Freshwater Fishes

There are 9 families of fishes represented in local waters and all except Family I belong to the group Teleostei.

Family I Petromyzontia (Order Hyperoartia, Class Agnatha)

A mass spawning of lampreys, in the Holy Brook, was observed by Mr.B.R. Baker. So far as I know, fishes have neither been taken with lampreys attached, nor with scars of previous attachment, therefore I believe the species seen by Mr. Baker to be Lampetra planeri (Bloch). This is the only British cyclostome that is not parasitic because, following three years of larval development spent inconspicuously buried in the mud where it filters a living, it metamorphoses into a non-feeding sexually mature adult, which spawns and dies soon after.

The Families II, III and IV of this list are representatives of the higher teleosts, they are all characterised by the possession of spiny fins and ctenoid (comb-like) scales. Also, characteristically, the pelvic fins are forward under the pectorals.

Family II Percidae (Order Percomorphi, Class Osteichthyes)

The Perch family has two local species, the perch, Perca fluviatilis.L. a handome fish found in most local waters including many of the isolated lakes and ponds.

This species has two dorsal fins, the anterior one being supported on erectile spines, the posterior one with soft, branching rays. A well-coloured specimen will be dark green above, yellowish on the sides and white below, whilst across the yellow it will have about five black bands and the paired fins will be red.

A carnivorous fish, it feeds on other fishes and will take worms. I have seen a small perch swimming alongside a shoal of fry and, without disturbing the shoal, quietly picking them off one by one. The largest perch caught by rod and line was recorded at 5 lbs. 15 ozs. 6drms., but may have weighed 6 lbs. as the scales were later found to be inaccurate. While several specimens have been recorded over 5 lbs., they are not common. A perch over 3 lbs. is considered a good one. It is possible, that under ideal conditions, that specimens of 10 lbs. occur, but, so far, none has been authenticated in the records of rod-caught fish.

The other species of this family, found in local waters is the ruffe or pope. Acerina cernua (L). An insignificant fish by comparison with the perch, it rarely exceeds 8 inches in length and a few ounces in weight. It is brownish in colour with darker speckles and the two dorsal fins are joined. A carnivore, the ruffe feeds on any small animals it can find. Both the perch and the ruffe have teeth in the mouth.

Family III Cottidae (Order Scleroparei Class Osteichthyes)

Only one species of this family occurs locally, the bullhead, Cottus gobio.L., known in olden times as the 'miller's thumb' because of its broad, flattened head. An extremely spiny fish, all fins except the tail are supported by spines and there are also spines on the operculum.

The scale-less skin is brownish, splashed with darker brown, which makes the fish difficult to see as it lies on the bottom and since it often burrows under stones it is more often overlooked than seen. It feeds on small fishes and other small forms of life which it seizes in a quick dash from its hiding place.

Family IV Gasterosteidae (Order Scleroparei Class Osteichthyes)

The two species from this family occurring locally are very well known. They are the three-spined stickleback Gasterosteus aculeatus L, and the ten-spined stickleback Pygosteus pungitius (L).

The anterior dorsal fin is reduced to a series of erectile spines, the number giving the species its common name. The pelvic fins, well forward under the pectorals, are reduced to single spines.

In both species the number of scales is much reduced, a few scutes or plates occur along the side of the body. Gasterosteus builds a nest at the bottom of the stream whilst Pygosteus builds in water plants off the bottom.

Both species are noted for the breeding colours of the males. In the former the breast becomes scarlet while the latter becomes jet black. In spite of their small size, rarely more than two inches in length, their pugnacity during the breeding season is well known.

The following families (V, VI, VII, VIII and IX) belong to the lower teleosts and are the ray-finned fishes, that is the fins are supported by soft, branched rays. Occasionally the first ray of the dorsal fin is replaced by a spine. The scales are cycloid.

Family V Salmonidae (Order Isospondyli Class Osteichthyes)

The whole family can be recognised by the small, fleshy, dorsal or adipose fin, without rays, whichis situated posteriorly to the typical rayed fin. No other British family has this adipose fin, therefore its presence is a sure identification of the family.

The trout Salmo trutta L. occurs in many varieties to which some writers attribute specific status. However, no anatomical differences can be found, therefore it is probable that there is only one species and that different habitats and, in particular, different feeding are having their effects on the appearance of the fish. Given sufficient time, the varieties might well become true species especially as many of them are geographically isolated.

Trout are sometimes taken in the Thames and Kennet, but are by no means common and it is possible that these fish are wanderers from privately stocked waters. Some of these fish however, may spawn in higher reaches of the Thames and its tributaries. The river Pang and some enclosed waters in that area are stocked with trout by the owners of the fishing rights.

The trout and its relative, the grayling, thrive in fast flowing, chalk streams. They both require water of high purity and high oxygen content.

The size of trout varies enormously from water to water. Many of the smaller streams are fortunate if they can boast trout of two pounds, yet in the larger lakes of England and lochs of Scotland it is possible that they reach fifty pound. The record rod-caught fish weighed 39½ lbs and was taken in Loch Awe.

The grayling Thymallus thymallus (L) a beautiful fish with a long, backward pointing dorsal fin with colourful stripes, occurs in some reaches of the Holy Brook. Its distribution in England coincides with the distribution of the monasteries. It was probably introduced by the monks, who knew the culinary virtues of this fish.

While, in general, members of the Salmonidae are autumn spawners, the grayling spawns in the spring from March to May. The record weight for grayling is 7 lbs. 2ozs., but a 2 lb. or better,fish is reward enough.

Family VI Esocidae (Order Haplomi Class Osteichthyes)

The pike Esox lucius L. is the sole species of this family in local waters. A fish-eater with very prominent teeth set in long jaws, the pike is easily recognised by its torpedo shape and the rounded dorsal and ventral fins positioned well back beyond the pelvics. A well camouflaged fish with green back and sides marked irregularly with darker bands and blotches, it waits very still and invisible in the shelter of water plants, making sudden dashes to catch its prey.

As with the trout, larger waters generally produce bigger fish. A fish above 10 lbs is a fair one, above 20 lbs a very good one. The best for the Thames is 29½ lbs while the record for England is 37½ lbs, the latter was taken from the Hampshire Avon, a very prolific water. The Irish lakes hold the record for the British Isles with a 53 lb. specimen. Larger fish have been reported but not properly authenticated. In Ireland, with the accent on salmon and trout, pike are not heeded, nevertheless, several fish above 40 lbs and many above 30 lbs have been taken.

Family VII Anguillidae (Order Apodes Class Osteichthyes)

The eel Anguilla anguilla (L) may be recognised by its snake-like shape, lack of pelvic fins, apparent lack of scales (actually they are very small and deeply embedded in the thick skin) and the long dorsal and ventral fins meeting at the tip of the tail.

This is the only local representative of its family. It will eat any dead or moribund fish or other animal remains. A slimy fish, it is able to travel overland from one water to another, usually at night assisted by the dew. It may not reach sexual maturity until 20 years old. Eels have appeared in very old records above 20 lbs, and, more recently, one of $16\frac{1}{2}$ lbs was netted. The record rod-caught specimen weighed $8\frac{1}{2}$ lbs.

The eel is considered a delicacy but few are angled for, most being taken by basket traps set at weirs. Many of the eels used for food in this country are imported from Holland.

Family VIII Cobitidae (Order Ostariophysi Class Osteichthyes)

The stone loach, Nemacheilus barbatula (L) is the only species of this family found locally. It has been found in a stream at Pinge Wood and also in the Pamber Forest brook. It is a small, slim fish about 3 or 4 inches long, without scales and with 6 barbels around the mouth. Its brown blotched colour and a habit of hiding under stones makes it very inconspicuous.

The loach often dashes about in an excited manner in thundery weather, earning it the name of 'weather fish'. It also has the interesting habit of gulping air, which it passes through its intestine where respiration occurs; this it does when the oxygen content of the water is low. While intestinal respiration is not uncommon amongst aquatic animals, it is usually done by passing in a current of water.

Family IX Cyprinidae (Order Ostariophysi Class Osteichthyes)

There is one dorsal fin and the pelvic fins are situated well back from the pectorals on the ventral surface. There are no teeth in the mouth, mastication occurs in the pharynx by means of protuberances on the hyoid arch. In the breeding season the males develop white tubercles on the head and may adopt special breeding colours.

This large family has 14 local species, which are able to inhabit waters varying from muddy ponds to fast-flowing clear streams.

The carp, Cyprinus carpio.L. occurs in three varieties:- the common carp normally scaled, one with a few, large scales dotted about along its sides called the mirror or king carp, and a scaleless variety called the leather carp.

This species is the lake or pond fish par excellence. It has a reputation for being very cunning and difficult to catch, which is borne out by anglers' experience. However, many large carp have been taken and the present British record is a common carp of 44 lbs which is now in the London Zoo Aquarium. A carp of 10 lbs or over is a fair one and one of 20 lbs or over is one to remember.

Carp may be recognised by the long dorsal fin, short ventral fin and four barbels.

The crucian carp, Carassius carassius (L), is a much smaller species, with a less deeply forked tail. Seldom exceeding 3 lbs in weight, the crucian carp also differs from the common carp in having no barbels. The rod record crucian carp weighed 4 lbs.11ozs.

The related goldfish, Carassius auratus (L), may be included here since it has been intrcduced into the lake at 'California' where it may be fished for along with other carp and tench. This fish resembles the crucian carp but has a more deeply forked tail.

The roach, Rutilus rutilus (L), is perhaps the most common species of this family, occurring in most rivers and many lakes and ponds. A fairly deep-bodied fish, dark green above, with silvery sides and reddish fins, it is a popular fish with anglers. A 2 lb. fish is considered a specimen but the record stands at 3 lbs. 14 ozs.

The rudd, Scardinius erythrophthalmus (L) is very similar to the roach but tends to be deeper-bodied and more brightly coloured, with a definite golden sheen on its sides. It can be distinguished by its protruding lower jaw, (the roach has a receding lower jaw), and by the position of the dorsal fin posterior to instead of level with the pelvic fins. The record is 4lbs. 8ozs.

Both of these fish will feed not only on small molluscs, crustaceans, annelids and insect larvae but also on vegetable matter. The roach, in particular will feed on silk weed, a green, filamentous alga that grows on submerged walls, piers etc..

The dace, Leuciscus leuciscus (L), is a small, active, silvery fish, found in flowing water often where there is a strong current. It takes insects at the surface, but larger specimens will feed at the bottom as well. A 1lb dace is one to remember as it has extraordinary fighting qualities. The heaviest rod caught specimen weighed 1 lb. 8ozs. 12 drms.

The chub Leuciscus cephalus.Day., which may be confused with the dace, particularly when young, is a heavier built fish with a broader head and larger scales. The fins tend to be reddish except the caudal fin which is blue. A sure diagnosis is the shape of the dorsal and ventral fins, concave in the dace and convex in the chub, hence the angler's tag "dented dace and curved chub".

The record chub was 10lb. 8oz., but a five pounder is a good one. A great variety of baits is taken by chub including elderberries, cheese, bread, worms, crayfish, frogs, artificial spinners and flies. It is reasonable to assume that it will eat anything that moves near it.

The minnow, Phoxinus phoxinus (L), rarely exceeds 4 inches in length and is an active fish of shallow waters. It feeds on small crustaceans and vegetable matter such as algae, and will also take insects and their larvae. A colourful little fish, with a golden gleam along its sides broken by dark patches. Its body is thick, the head rounded, the tail slim and the caudal fin deeply forked.

The five fishes, dace, chub, roach, rudd and minnow have all been included in the genus Leuciscus by the anatomist Day, but the genera Phoxinus, Rutilus and Scardinius are still generally recognised although the genus Squalius for the chub is not generally used today.

The barbel, Barbus barbus (L), is reckoned, next to the pike, to be the finest coarse fish for angling purposes. Many an angler has struck a barbel and been convinced it was the bottom, so powerful are the larger specimens.

A bottom-loving fish, the barbel is often found in large shoals in the tails of weirs, where it snaps up the many delicacies brought to it by the stream. It will take insect larvae, particularly caddis larvae, worms, crustaceans and such bait as cheese, bread paste and so on, and there is even one record of a barbel taking a dry-fly at the surface.

The record for barbel is 14lb 6oz; three specimens have been recorded at this weight. The biggest barbel angled weighed 16lb. It was caught in the Lea in 1880, but for some reason is not recognised. The general colour of this fish is a rich brown with white ventral surface. It has 4 barbels and a ventral, crescent-shaped mouth.

The gudgeon, Gobio gobio (L), resembles the barbel in shape, being long with a ventral mouth and fairly pointed snout. It differs in having only 2 barbels, in having patches of dark colour which have a deep blue sheen, and in reaching a maximum size of only a few inches. The largest recorded gudgeon weighed 4 oz.4 drm., and three specimens of this weight have been taken.

This fish, like the barbel, is a bottom feeder and can be attracted to a particular place merely by raking over the area, whereupon it moves in to feed on the organisms dislodged by the rake. Like the barbel, it enjoys a flowing stream over a gravel bed.

The tench, Tinca tinca (L), gives the impression of a round fish, for all its fins are rounded (convex) and its body is round and plump. In colour it is dark brown dorsally shading to green on the sides, all the fins are coloured and it has a small red eye. There are two barbels by the slightly ventral mouth.

This fish is found in most of the enclosed waters of the area, where it feeds in the mud which it churns over to find the organisms on which it feeds. These include annelids such as Tubifex, molluscs, insect larvae and even the mud with, no doubt, a vast flora and fauna of protozoa, flagellates, diatoms and bacteria.

The record weight for tench is 8lb. 8oz. A lethargic fish, it requires much patience to hook one, and then much skill to land it, in view of the habitats it delights in, which are usually overgrown with aquatic plants and further encumbered by fallen branches of bordering trees or the roots of willows.

The bleak, Alburnus alburnus (L), is a lively, surface-feeding fish, its oblique jaws and dorsal mouth point to this. A small slender fish that swims rapidly, taking aquatic insects as they hover over the water, or any edible morsel that enters the surface waters, it is a pest to anglers because of its small size and willingness to take bait offered for more worthy quarry.

Superficially like the dace it can be distinguished from that fish by the mouth (terminal in the dace) and the long ventral fin (much shorter in the dace). It is anatomically similar to the sprat.

While no one yet has begun large-scale canning of bleak, there is an industry associated with this fish. Some six thousand bleak provide enough scales for the extraction of 1 lb. of a substance used in the manufacture of artificial pearls. This substance is contained in the iridiocytes of the scales, which give the fish its flashing, silvery appearance.

The two species of bream are, I believe only found in the Thames and not in other local waters. Both are very much laterally compressed. The first of these, the common bream, Abramis brama (L), is a deep-bodied fish with a long ventral fin and a deeply forked tail, the lower part of which is much longer than the upper.

It lives in deep "holes", where the current is steady rather than fast, feeding on the bottom. It will bask near the surface in warm weather returning to the bottom for feeding or if disturbed.

A large bream weighing 17 lb. was found dead, but the angling record is 13 lb. 8 oz.

The silver bream, Blicca bjoernka (L), is a very similar fish in shape but not in size, the record weight being only 4 lb.8 oz. It is difficult to separate small common bream from silver bream, apart from colour, which is very often of doubtful value. The only other obvious difference is the 3 unbranched rays in the ventral fin of the silver bream.

The identification of the Local Fishes

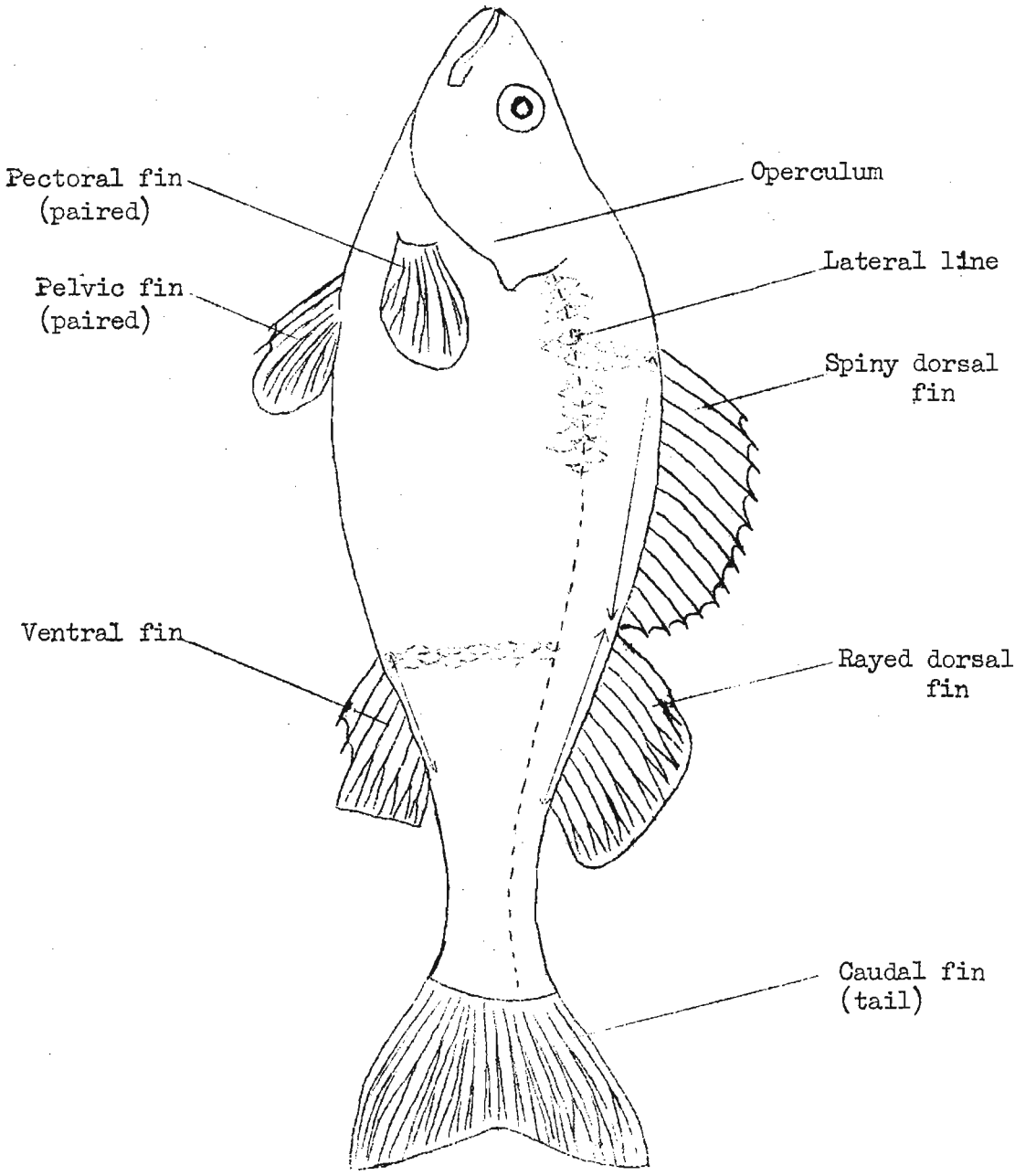
This is considerably simplified by the limitation of the field to only 25 species. Whereas a zoologist might require scale counts, fin-ray counts and possibly a dissection in order to identify a fish from the vast array of species that exist, it is possible for an experienced angler, who knows his local fish, to identify them offhand with accuracy.

The angler, however, might have to call in a zoologist to carry out his counts etc., if he encounters a hybrid. Owing to the manner of external fertilisation, many hybrids could arise where more than one species are spawning together.

All fishes submitted for record purposes must be properly authenticated, which is carried out by an expert.

The weights I have quoted are from a list published by "Angling Times" 16th December, 1955.

IDENTIFICATION FEATURES APPLIED TO THE PERCH (Perca fluviatilis.L)



Scale counts are taken along the lateral line and across the body. Fin rays are counted in dorsal and ventral fins. The length of the dorsal and ventral fins is indicated by the arrows in the diagram. Obviously the size of the scales and length of fins is closely related to scale and ray counts.

During growth, scales and fin-rays become enlarged but do not increase in number, therefore determination counts are constant for the species.

A simple key for identifying the fishes of the Reading area
(hybrids excluded)

1	No paired fins	Lampetra planeri	
	1 pair of paired fins (pectorals)	Anguilla anguilla	
	2 pairs of paired fins (pectorals & pelvics)		2
2	Dorsal fins (2) separate, both spined	Cottus gobio	
	Dorsal fins (2) separate, first one spined	Perca fluviatilis	
	Dorsal fins (2) joined, first one spined	Acerina cernua	
	3 separate spines anterior to rayed dorsal	Gasterosteus aculeatus	
	10 separate spines anterior to rayed dorsal	Pygosteus pungitius	
	Dorsal fins (2) one rayed, one adipose	Salmonidae	3
	Dorsal fin (1) rayed		4
3	Salmonidae - rayed dorsal short	Salmo trutta	
	- rayed dorsal long & striped	Thymallus thymallus	
4	Rayed dorsal well back behind pelvics (confirm prominent teeth in large jaws)	Esox lucius	
	Rayed dorsal never very much behind pelvics (confirm no teeth in mouth)		5
5	6 barbels round mouth	Nemacheilus barbatula	
	4 or less barbels round mouth	Cyprinidae	6
6	Dorsal fin long, ventral fin short		7
	Dorsal fin short, ventral fin long		8
	Dorsal fin short, ventral fin short		9
7	4 barbels round mouth	Cyprinus carpio	
	No barbels round mouth	Carassius sp	7a
7a	Caudal fin slightly forked	Carassius carassius	
	Caudal fin deeply forked	Carassius auratus	
8	Mouth opening dorsal, jaws oblique	Alburnus alburnus	
	Mouth terminal		8a
8a	Anterior 3 rays of ventral fin unbranched	Blicca bjoernka	
	All rays of ventral fin branched	Abramis brama	

Key continued

9	4 barbels round mouth	Barbus barbus
	2 barbels round mouth	9a
	No barbels round mouth	9b
9a	Small scales, uniform colour, rounded fins	Tinca tinca
	Larger scales, blotched, pointed fins	Gobio gobio
9b	Dorsal & ventral fins concave	10
	Dorsal & ventral fins not concave	11
10	Pectoral & pelvic fins red	10a
	Pectoral & pelvic fins not red	Leuciscus leuciscus
10a		
	Lower jaw protruding & dorsal fin behind pelvics	Scardinius erythrophthalmus
	Lower jaw not protruding, dorsal fin level with pelvics	Rutilus rutilus
11	Body marked with dark patches, scales minute	Phoxinus phoxinus
	Body not marked with dark patches, scales large, paired fins pink, dorsal & ventral fins convex	Leuciscus cephalus

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