

TRANSACTIONS
AND
PROCEEDINGS
OF THE
PERTSHIRE SOCIETY
of NATURAL SCIENCE

for the years 1963-65



VOLUME XI
(following on Volume X part III)

PUBLISHED BY THE SOCIETY AT
CITY OF PERTH MUSEUM & ART GALLERY

1966

Council 1966-67

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VOLUME XI

Foreword

THE SOCIETY takes pleasure in presenting its transactions at this time. The selection of material and the editing has been the work of the editorial sub-committee, of which the convener is Mr. A. Watt Robson, and the members Dr. M. E. C. Stewart, F.S.A.SCOT., and Miss B. Ferguson, M.A.

Cyril Walmesley—our president for 21 years and until his death in 1956—was the author of the first paper, “Solar Eruptions,” his presidential address. Existing only in manuscript form, it required to be rounded, not amended, and for this we are indebted to Mr. James Paton of Abernethy. It seems to us a singularly fitting paper with which to open these transactions.

Since 1954, when the last volume of our transactions was issued, the Society has known changes—changes for the better mostly. Our membership has risen to 250, the increase for the most part being due to new members in the sections, but also to the formation of the Ornithological Section in 1963. This met with immediate success and is now one of the Society’s strongest sections. In the Archaeological and Historical Section a broadening of outlook was introduced to bring more emphasis to the historical aspect of its activities as against the prehistoric. Its appeal is consequently wider. The Botanical Section has been active in the field since its formation in 1957 and hold their own in membership, while the

photographers keep adding gradually to their numbers. All sections are in good heart. Notes on them will be found at the end of this volume.

The Society has suffered loss through death of a number of its members during the past 12 years. As already mentioned, Cyril Walmesley, A.M.I.C.E., M.I.W.E., F.R.A.S., our president for 21 years, died in 1956. He set us all the highest of standards in his devotion to the Society whose interests he upheld throughout difficult times during and after the Second World War. A past-president of the Society, Mr. William Malloch, whose devotion and support for the Society throughout many years equalled that of Mr. Walmesley, died in 1963. Dr. James Kelman, Mr. Peter K. McLaren and Mr. Ian Thomson are names of other staunch supporters of the Society who have passed on since the last publication. They are well remembered.

Two contributors deserve special mention in that, as non-members, their papers are by special request. They are Dr. Anne Ross, recently with the School of Scottish Studies at Edinburgh University, and Mr. A. C. Crundwell of Glasgow University. Experts in their fields, they were invited to contribute on the "Muirton Head" and "Bryophytes" respectively. We are grateful to them for their contributions to our local records.

Finally, I should like to express in the name of the Society our warmest thanks to the Editor of these transactions and his sub-committee for producing this splendid volume and our appreciation in them of these qualities which are so necessary in overcoming difficulties, both editorial and economic.

DR. W. H. FINDLAY, M.B., D.P.H.

President.

Solar Eruptions

Cyril Walmsley, A.M.I.C.E., M.I.W.E., F.R.A.S.

Presidential Address, 30th March, 1956.

When I opened my daily paper on 24th February, I saw in heavy headlines this announcement:

“Eruption in the Sun.”

“The biggest yet say experts.”

“An eruption occurred in the sun in the early hours of yesterday morning. In the words of the announcement from Greenwich Royal Observatory: ‘A remarkable event has occurred on the sun resulting in a large increase in the cosmic ray intensity for a period of two hours. Cosmic ray intensity was more than doubled.’ That means that the atomic particles which bombard the earth from space were coming in twice as fast as normal. The event caused excitement among the experts at the various cosmic ray observatories where a day and night record of the traces of incoming particles is kept.”

On the following day even bigger headlines proclaimed: “Strange goings-on on the Sun.” “Solar Bombardment baffles Scientists.” “Something very strange has happened on the sun—so extraordinary in fact that after 36 hours of research, Royal Observatory scientists were still baffled last night.” (The journalist doesn’t expect much of the scientists, does he? There are many problems which have baffled scientists for 36 *years!*) To continue the newspaper report—“What appears to have been an average sunstorm has caused the most violent bombardment of the earth ever recorded by cosmic radiation and thrown radio communications out of contact some 24 hours later. From India came the first visual report of the Solar Flare at 3.31 a.m. on Thursday, 23rd February. A few minutes later the level of cosmic rays had doubled at sea level and was creating havoc in the upper atmosphere. Mr. Arthur Gold, chief assistant to the Astronomer Royal, is reported as saying

'We have never met a solar flare which behaved like this.'” At this time a submarine, H.M.S. Acheron, on an exercise in the North Atlantic, normally reporting regularly by radio to its base, suddenly apparently ceased to send messages. Contact was lost for three days, and, fearing disaster, the Admiralty organised full scale search operations. Mercifully all was well. Tremendous electrification down to abnormally low layers in the polar atmosphere was absorbing the signals from the Acheron and producing what was to be called a polar black-out.

A few decades ago an event such as I have just mentioned, occurring at a distance of 93 million miles from the earth would have been of no interest to the “man-in-the-street” and would probably have escaped the notice of anyone other than perhaps a few astronomers.

To-day, as man probes further and further into the secrets of Nature—particularly in the field of electronics—and harnesses the tremendous forces locked within the atom to his own purposes, he is becoming increasingly sensitive to events occurring in the vast power-houses of the Universe—the stars.

The earliest occasion which I recollect, on which an event on the sun caused serious alarm to many people in Britain, and probably elsewhere, was during the War on 27th and 28th February, 1942—though the story was not made known until after the War.

On those dates, army radar equipment operating on the 4 to 6 metre wave band experienced serious interference and it was thought at first that the “enemy” had developed some method of jamming. It was soon found, however, that the interference originated in the neighbourhood and ceased at night. The power of the interfering radiation was astonishing, being some 100,000 times that expected from a body with a surface temperature of 6,000°K like the sun.

It was of course known that the sun emitted radiation in the radio-frequency band, but the intensity of the radiation which caused the radar interference took the experts wholly by surprise. It was later learnt from Meudon Observatory that solar flares occurred on these two days and also on 1st March, and the radar interference was the first repercussion on the earth. There was also a sudden fade-out of radio communications on 28th February from 12 noon until 8 p.m., and on 1st March at 7.27 a.m. a great magnetic storm broke out with extreme suddenness.

All these events are associated with the occurrence on the sun of large solar flares or eruptions, so let us now turn to consideration of the characteristics and behaviour of the flares themselves.

Flares may be of all sizes from quite small ones covering an area of a mere 100,000 sq. miles or so up to great ones which may cover an area of several hundreds of millions of square miles and be comparable with the largest sunspots in size.

Astronomers classify them in order of increasing importance as of Importance I, II, III and III + . The *visible* light which they emit and by which the astronomer sees and photographs them, consists of the bright emission lines of the Balmer Series of Hydrogen, together with neutral Helium and a number of lines of ionised metals. They are usually observed and photographed in the *Halpa* light of hydrogen, and although the emission of light of this wave-length by the flare is much more intense than the light of the corresponding wavelength in the continuous spectrum of the photosphere—so that when all other light is excluded, the flare shines out brightly against the hydrogen emission of the solar disc—it is quite swamped by the light of myriads of wave-lengths given off by the photosphere. It cannot be seen by the integrated light of the ordinary telescopic image but must be observed by means of the spectrohelioscope.

Great flares are fairly rare phenomena, but flares of lesser importance are not very infrequent particularly near the period of sunspot maximum and what I have to say about great flares may be taken as applying in proportionate degree to the lesser flares.

The main characteristics of great flares are:—

1. Usually, a minute or two before the flare becomes visible, a burst of radio emission strikes the Earth. (Radio emission is of course continuously arriving from the “quiet” sun, but these bursts are very intense in comparison with the normal background of solar “noise” as the radio-physicists term it.)

2. Then, in the course of a few minutes and without warning, brilliant, sinuous, rope-like filaments shine out in hydrogen light across a large spot group, and as I have already said, may attain a size of several hundreds of millions of square miles.

3. The radiation emitted by the flare is both wave and *corpuscular*. The wave radiation consists of visible wave-lengths to which I have already referred (i.e., Hydrogen, etc.) and also very intense ultra-violet radiation. These wave radiations reach the earth in a matter of eight minutes from the start of the outbreak and cause the D layer of our atmosphere to become ionised to an abnormal depth, thus absorbing the ionospheric reflections by which short wave radio is transmitted round the globe and so producing fade-outs. As the ionisation is due to these ultra-violet light waves, it only occurs on the sunlit side of the earth and does not affect the night side. This heavy ionisation also gives rise to ionisation currents which generate perturbations (“crochets”) in the earth’s magnetic field, i.e., a magnetic storm. These again are mostly felt on the sunlit side of the earth.

The wave radiation spreads out in all directions from the flare and therefore the above effects are felt to a greater or lesser extent whatever the position of the flare on the sun’s visible disc.

The corpuscular or particle emission, on the other hand, is radiated nearly normally to the sun's surface, so that the beam may miss the earth entirely if the flare is more than say 40° in longitude E. or W. of the sun's central meridian.

This particle bombardment takes about 24 hours to traverse the 93 million miles from the sun to earth as compared with just over 8 minutes for the wave emissions, so we get a second disturbance, in the shape of a magnetic storm, perturbations of long-wave radio and perhaps an auroral display about a day after the occurrence of the flare.

These particle projectiles seem to consist of charged ions of hydrogen and of heavier nuclei of enormous energy corresponding to cosmic ray particles with energies of billions of electron volts and may cause a very marked increase in the cosmic ray intensity for the time being.

Flares are often accompanied or preceded by a fierce burst of eruptive prominences, but whereas the eruptive prominences attain enormous speeds and rise to great heights, flares do not exhibit any great velocities of movement either vertically or laterally.

The duration of a flare may be anything from less than an hour to more than half a day. Their nature and cause are unknown. A section of the sun's atmosphere appears to suddenly rise in temperature to an extraordinary degree and as quickly cool again. They are certainly closely connected with active sunspot groups and do not occur except in their vicinity.

The flare that began at 0331h G.M.T. on 23rd February last (1956) reached a maximum at 0342h and ended at 0415, causing the most striking cosmic ray event that has so far been recorded. The polar radio black-out lasted for several days. The recordings of the many terrestrial events that accompanied this unusual flare will provide subjects for study by specialists for some years to come.

Excavation of a Circle of Standing Stones at Sandy Road, Scone, Perthshire

Margaret E. C. Stewart, Ph.D., F.S.A.Scot.

On the eastern margin of Scone Wood less than half a mile west of New Scone village (Nat. Grid NO/132265) are the remains of two circles of standing stones which have probably been tangential to one another. Prior to excavation the site was covered by young birch wood and scrub (*Plate 1*), and previous to this, mature timber had been taken from the area during the First World War. As a result of this forestry activity the eastmost circle is now almost

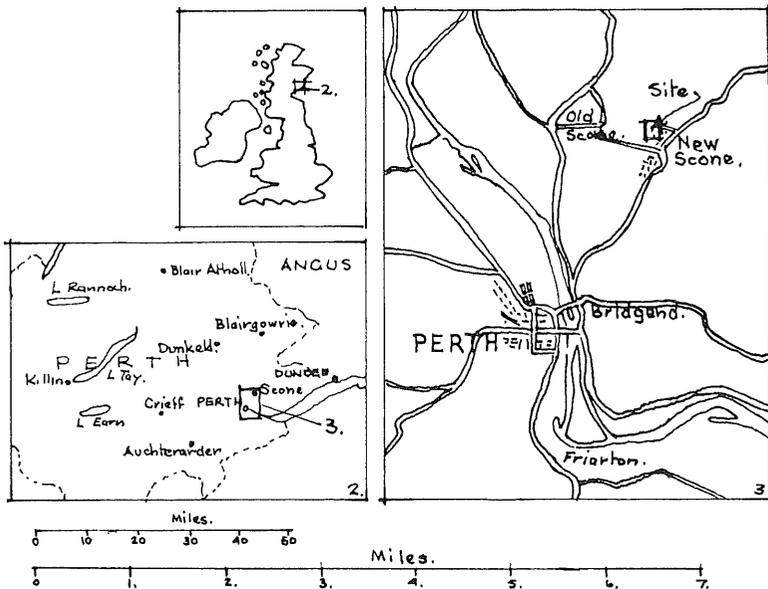


Fig. 1: Location Map.



Plate I: Felling timber on the site prior to excavation.



Plate II: Stone I from north, showing keel and stabilising face.



Plate III: Stones VII (nearest camera), I and II looking south-east.

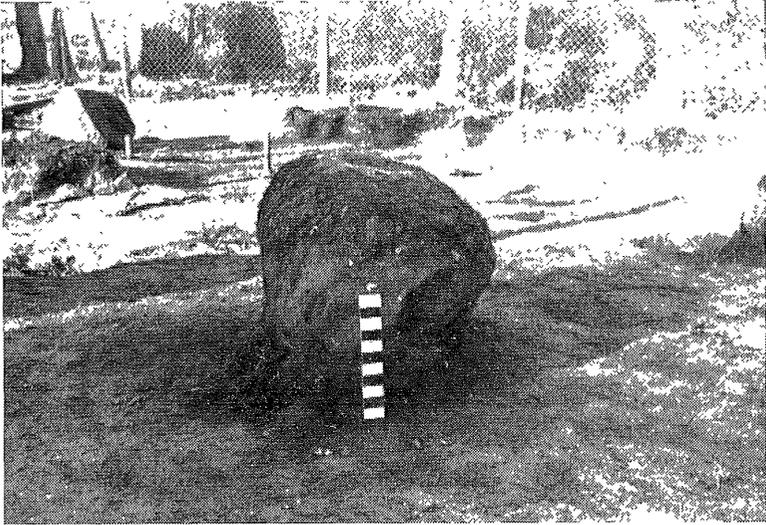


Plate IV: Stone III showing pointed base and stabilising face.

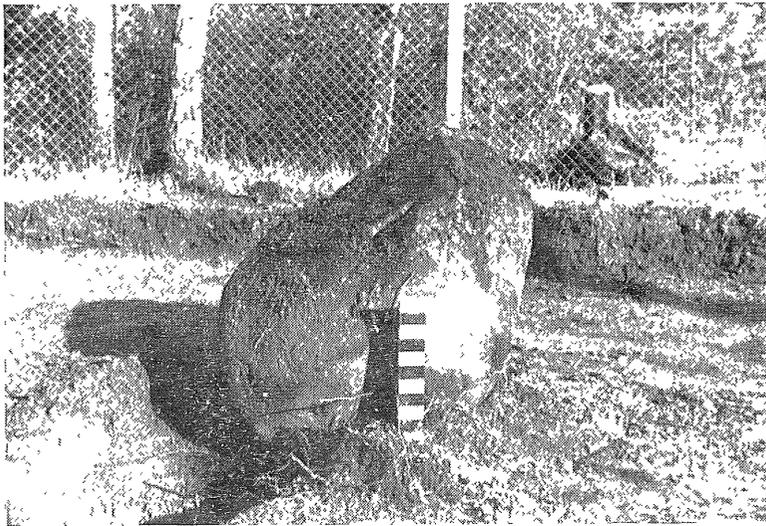


Plate V. Stone IV poised on edge of socket.

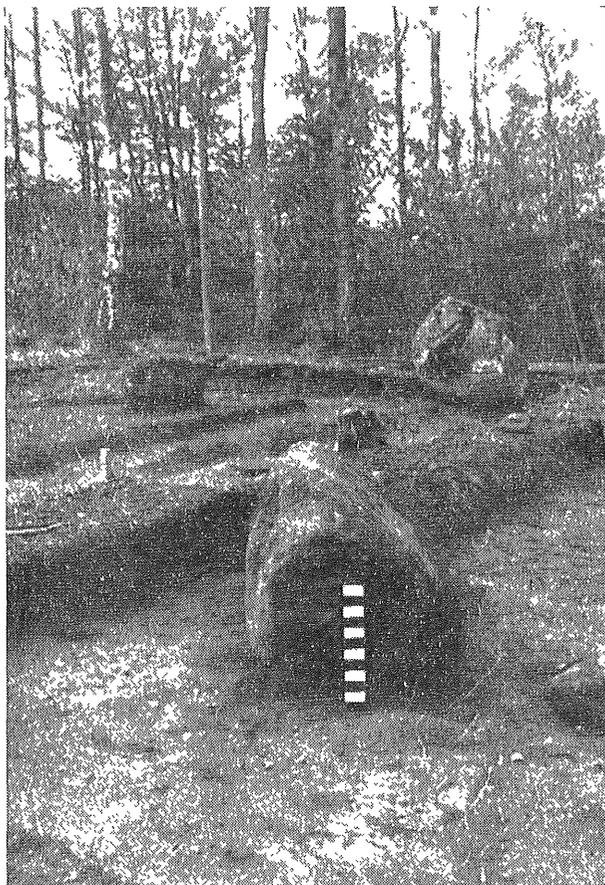


Plate VI: Stone VI from the north with Stones II and III
in background.

totally destroyed. Three stones¹ measuring $2' 10'' \times 2' 5'' \times 1' 3''$ and $3' 3'' \times 3' 2'' \times 8''$ and $2' 10'' \times 1' 9'' \times 7''$ from north to south lie more or less loose on the surface of the ground on what was probably the western arc of the eastmost circle, but as the stones are no longer *in situ* the true perimeter of this circle is not now known.

In 1961 a housing scheme was planned for the eastern part of Scone Wood west of Sandy Road (*fig.1*) and as the circles were scheduled as ancient monuments by the Ministry of Public Buildings

¹ It is noticeable that the first two of these stones are "keeled" and have associated stabilising faces in the same manner as in six of the seven stones of the westerly circle.

and Works it was decided to excavate the second and more westerly of the circles which was still in a fair state of preservation. Charges for the excavation were met by Perth County Council. The birch wood and some older standing timber made excavation difficult, and difficulties were increased when it was decided to preserve the westerly circle as a central feature around which part of the housing scheme would be grouped. As a setting for the stones of the circle the County Architect wished to retain several of the young birch trees and though search was made to try and establish the socket holes of the easterly circle extensive tree roots near the surface

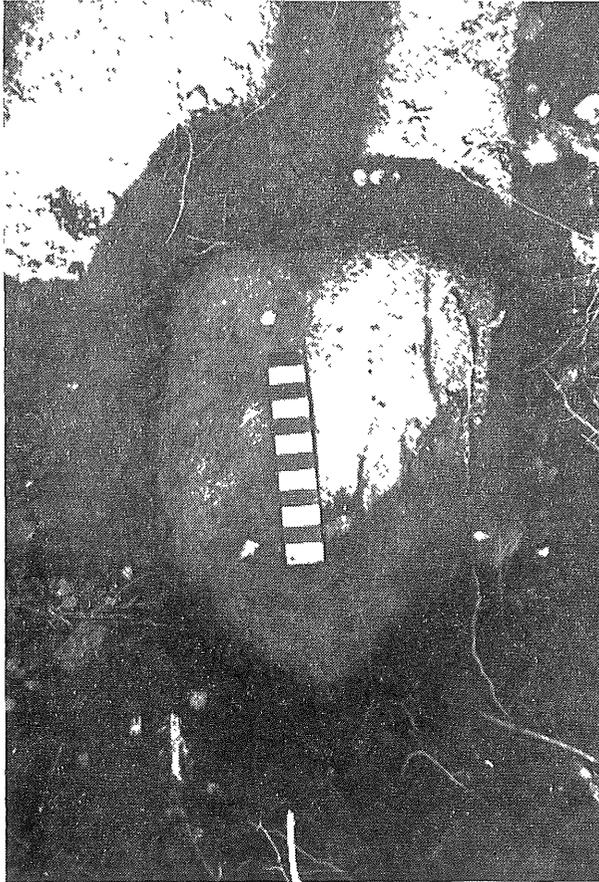


Plate VII: Possible Stone V. showing pointed base and stabilising face.



Plate VIII: Stone VII from east, showing diagonal stabilising face and packing stone.

soon made this an impossible task. However, there is ample oral confirmation of the previous existence of the easterly circle.²

The westerly circle now consists of seven stones set on the perimeter of an area approximately 18' in diameter.³ The largest stones lie on the west and south-west arc. Stone I (*Plate II*) lies on the surface, having fallen outwards from its socket. It measures

² The late Mr. William Small of Perth Road, Scone, who died between 20 and 30 years ago, had several photographs, now destroyed, of the Scone Wood circles. Mr. David Harris of 1 Perth Road, Scone, remembers the circles when they were complete.

³ See P.S.A.S., Vol. XLIII, 1908-09, p. 126.

$4' \times 2' \times 1\frac{1}{2}'$ in thickness. The rock is an ophimottled epidiorite. The upper surface which presumably originally faced inwards is very smooth compared with the rough back of the stone. The northern end of the stone is "keeled" and the turf line is still visible running across the face of the stone just above the top of the keel. From the point of the keel a stabilising face slopes diagonally upwards so that the point at which it meets the opposite side coincides with the turf line. The centre of the socket of this stone lies 2' from its northern end (*fig. 2*). The socket is 1' in diameter and is cut 10" into the underlying sandy clay. The keel is 9' long.

Stone II (*Plate III*), upright and *in situ*, lies 8' from the socket of Stone I and on the southern arc. It measures above ground $2\frac{1}{2}' \times 2\frac{1}{2}' \times 1\frac{1}{2}'$ in thickness. The rock is probably diorite. The stone has been roughly dressed to shape and the top has been "shouldered" on either side of a central ridge. A packing stone was visible wedged against the east face at ground level.

The next two stones on the eastern arc are more or less *in situ* though tipped out of their sockets and are remarkable on account of their insignificance. Stone III (*Plate IV*) is $3' \times 1' 10'' \times 1' 2''$ thick, of epidiorite, and has fallen inwards towards the centre of the circle from a very shallow depression dug into the underlying sandy clay. However, despite its smallness even this stone has had a pointed base sloping to a stabilising face both of which show signs of having been roughly dressed to shape. There also seems to have been a half-hearted effort to give this stone a "shouldered" appearance. Stone IV (*Plate V*) has fallen outwards from a socket which measured $1' 9'' \times 2' \times 9''$ deep. The stone which is of dolerite is $2' 8'' \times 2' \times 1'$ thick and again the base has been pointed, and it and the stabiliser face have been smoothed.

Stone V was missing, but the shallow socket, $11'' \times 9'' \times 6''$, was found in what would have been the next stone position on the northern perimeter. Stone VI (*Plate VI*) was lying loose. It is a long, hog-backed piece of dolerite 3' in length by $1\frac{1}{2}'$ wide at ground level. One end of this stone has been broken off in modern times and the detached portion was found nearby and was readily recognisable. Under the stone there was a shallow, squarish socket $15'' \times 14'' \times 4\frac{1}{2}''$ deep. On the eastern lip of this socket there was a quantity of carbon and the edge of the socket was stained black. When the stone was turned over the underside was found to be very smooth, and because the occurrence of smooth and rough faces had been already noted on other stones of the circle it seems probable that this face had been turned towards the interior of the circle.

Between Stone VI and Stone VII there was a small boulder of diorite measuring $2' 3'' \times 1' 9'' \times 6''$ in thickness (*Plate VII*). This stone was not *in situ* and examination of the surrounding area showed no sign of a socket. Also it is wrongly positioned on the

perimeter of the circle, being too near Stones VI and VII in comparison with the rest of the spacing. Because of its general resemblance to Stones III and IV in size and because the base has been dressed to a point and then diagonally upwards to form a short stabilising face it is probably the missing Stone V.

Stone VII (*Plate VIII*) is the most impressive stone of the circle, though its stability has been greatly jeopardised by the stump of a large beech tree. The stone which is of diorite is 4' overall in length, but the basal 2' is keeled and set into a socket cut 18" into the underlying till. A stabilising face has been carefully worked and where it meets the surface of the ground at 2' from the top of the stone a packing stone had been firmly wedged. The stone is 2' 5" broad and 1' thick across the flat top. The inner face of this stone has been carefully smoothed and is in contrast to the back which has been left rough.

Excavation

The site was enclosed in a pegged rectangle of 30' x 35' and with the exception of two 2' baulks which were left to give a north/south section, was taken down to the top of the underlying, undisturbed, sandy clay. The humus, varying from 1" to 2", was very black and peaty and represented the debris of a woodland vegetation. Below this there was a uniform level of reddish-brown sandy loam averaging 8" in depth and overlying a hard-packed sandy clay. Smears and flecks of carbon occurred at the base of the brown loam more especially in the northern and western areas of the circle, but these may well have been in consequence of earlier tree felling operations when it is known that the surface of the ground was levelled before replanting with birch.

2' north from the centre of the circular area an urn had been placed mouth upwards and uncovered in a socket dug into the hard, underlying, clayey sand. The rim of the urn had been almost totally destroyed, no doubt partially due to the fact that it had been covered by only 4" to 6" of loam. The urn, which measures 12" in height and 5" externally across the flat base (*fig. 3*), contained cremated bone and carbon compacted together with tree roots and soil. It is entirely undecorated. The ware is reddish-brown outside with a black core and the interior of the urn is heavily stained with carbon. The clay is full of large grit, has an open texture and is poorly worked but well fired. The rim of which about $\frac{1}{3}$ survives is pinched to a sharp edge with a steep interior bevel.

The cremated contents were only a token deposit and that this was of intention and not necessity is shown by the fact that they filled only a little more than half the urn. Carbon, some of it in cubes of more than 1", had been laid on top of the bones. The pot

rim had been partially broken in antiquity and after this carbon had been laid on top of the bones, for four sherds were found with the carbon which had then been sealed by an infilling of soil.

The urn is unlike Late Bronze Age cinerary ware and is related both by rim profile and fabric to the "flat-rimmed" wares of N.E. Scotland and particularly to the bucket urns of Covesea.⁴

⁴ P.S.A.S., Vol. LXV., 1930-31, p. 188.

Discussion

Pairs of circles of standing stones more or less tangential to one another are unusual, but within a radius of 12 miles from the example at Scone Wood there are two more examples. The first lies above the farm of Shian Bank, south of Scone Aerodrome and east of the main road from Perth to Coupar Angus.¹ These circles have been almost totally destroyed. During the Second World War concrete pill boxes were built in their immediate vicinity and lately the whole site has been smothered by the dumping of tree stumps. It is now difficult to say how many stones there have been in each circle, whether the stones are graduated in size and what the original diameter of each circle has been. The circles are not set so close to one another as the pair in Scone Wood. The second example is Tullybeagles, N.W. of Bankfoot.² Here the circles are well preserved. They lie on the south-facing slope of the watershed separating Strath Braan from the flat lands above Perth. The circles directly adjoin each other and in both the stones are graded in height so that the largest stones are on the western arc as at Scone Wood. But at Tullybeagles the stones of both circles are set very much closer to one another and often as little as 6" to 1' apart.

Apart from pairs, single circles of standing stones are frequent in Perthshire and within the general category types are beginning to emerge. In an area bounded by Crieff, Dunkeld, Coupar Angus, Perth and Forgandenny 14 circles of standing stones exist³ and in at least 10 a feature is the presence of a large stone or stones generally on the western or south-western arc from which the remaining stones decrease in size on either side until the smallest stone is opposite to the largest. A similar feature occurs in the recumbent stone circles of N.E. Scotland⁴ where the smallest stone of the circle is generally opposite to the recumbent stone and flankers. The Perthshire examples cited give an impression of degeneracy. The sockets are shallow, the packing perfunctory and the circles are generally on low-lying ground where they bear no

¹ Nat. Grid NO/156273, see Appendix I, Nos. 10 and 11.

² Nat. Grid NO/013362, see Appendix I, Nos. 13 and 14.

³ See Appendix I.

⁴ P.S.A.S., Vol. LXIX, 1934-35, p. 190.

relationship to a prospect. And yet the expert and recondite feature of keel and stabilising face is maintained, showing that there was a tradition based on considerable expertise in the handling of great stones.

It may be premature to claim a direct relationship between these Perthshire circles and the recumbent stone circles of the north-east. The problem is here stated for the first time and much more research and excavation will need to be done before such a relationship can be established, but the fact that a flat-rimmed urn was recovered from Scone Wood circle underlines the possibility of the relationship.⁵ It may be that here in eastern Scotland between Moray Firth and Tay towards the end of the first millenium there was a southward extension of people originally building recumbent stone circles in Aberdeenshire, but in Perthshire retaining only a vestige of these north-eastern traditions. It is tempting to relate their presence with the vast number of circular enclosures on the moors east of the rivers Tummel and Garry. These enclosure groups seem to belong chronologically⁶ and yet the two groups which have been excavated, Dalnaglar and Dalrulzion, produced highly individual pottery. The pottery from Dalnaglar is not comparable either in fabric or rim profile, but from Dalrulzion a well-fired fabric with plain bucket shapes and some steeply-bevelled rims was found. The enclosure groups do not occur west of Tummel and Garry and here small circles, of settings of four stones only, seem to form a mutually exclusive distribution with the closely-knit group of circles in the lower reaches of the Tay which have been discussed in this paper.

⁵ In view of the accepted derivation of recumbent stone circles from "ring cairns" it is worth noting that the latter are sometimes found in close juxtaposition—see *The Chambered Tombs of Scotland*: Audrey Shore Henshall, Edinburgh University Press, 1963, p. 21.

⁶ See P.S.A.S., Vol. XCV, 1961-62, p. 134.

Acknowledgements. The work of excavation was done by members of the Archaeological Section of the Perthshire Society of Natural Science. I am greatly indebted to the Perthshire County Architect's Office for help during the excavation and restoration. I am particularly grateful to Mr. R. J. Brien for taking practical steps to protect the monument during the excavation period and after. The Macaulay Institute for Soil Research advised about the soil profile, and I am very grateful to Miss Henshall of the National Museum for her work in restoring the urn, which was drawn for publication by Mrs. Megan Feachem.

The Appendices on East Perthshire Circles of Standing Stones and Charcoal are under the names of their respective contributors to whom my thanks are due.

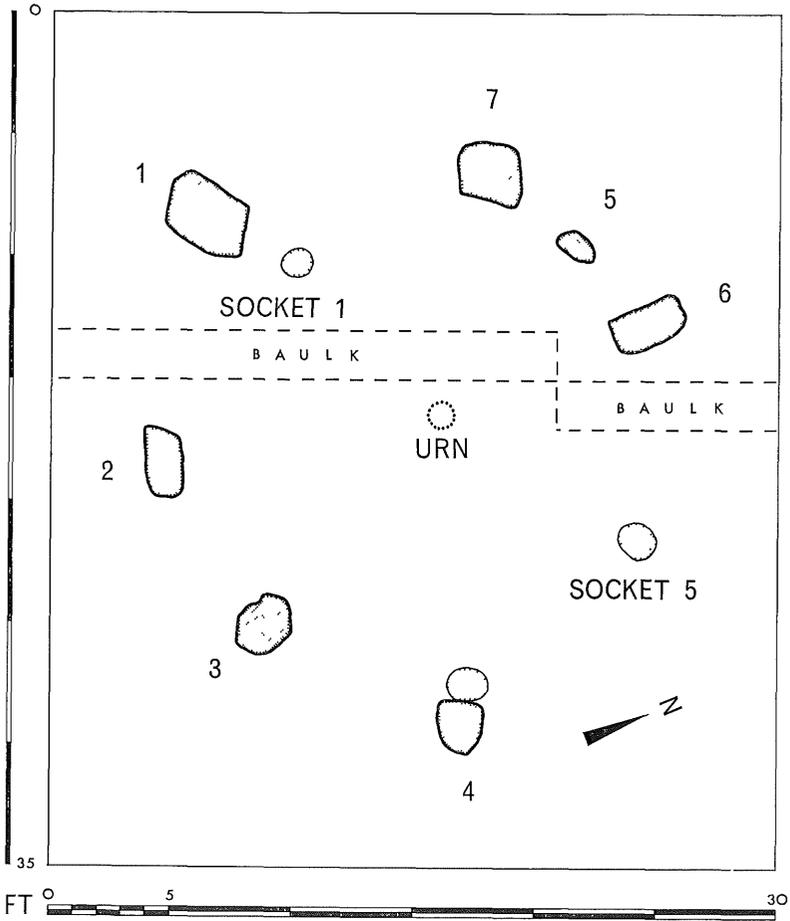


Fig. 2: Plan of circle.

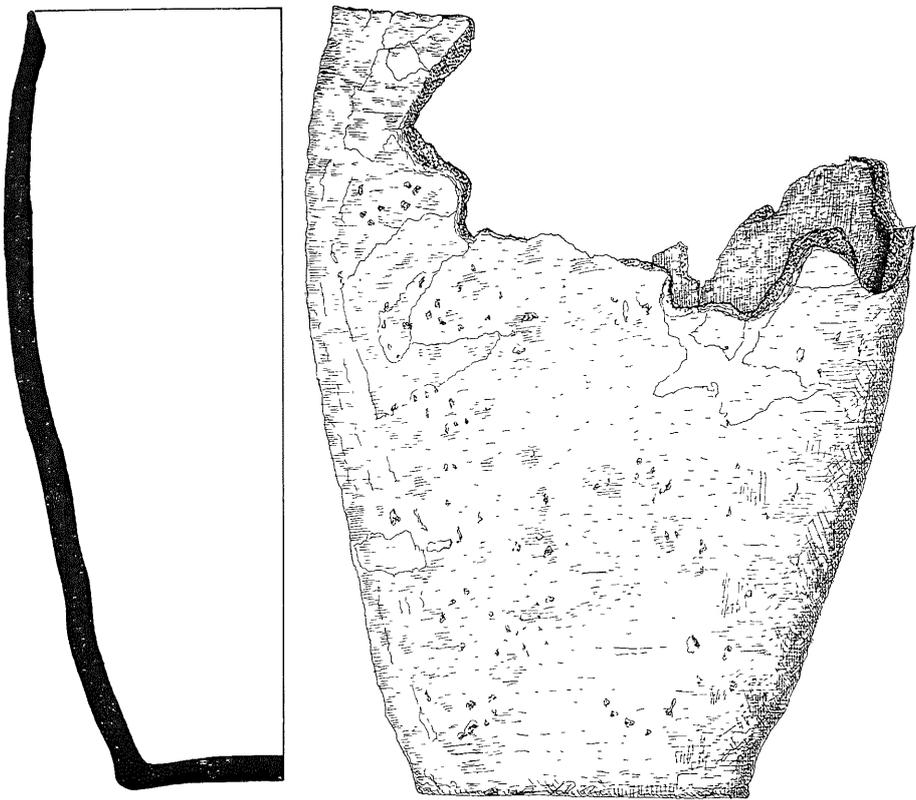


Fig. 3: Urn from centre of circle. Scale: $\frac{1}{3}$ actual size.

APPENDIX 1.—EAST PERTSHIRE CIRCLES OF STANDING STONES

No.	Name	Nat. Grid	Number of Stones	G=Graded Orientation of Tallest	Diameter	References	Comments
1	Ardblair	NO/160439	6		42'	P.S.A.S., Vol. XLIII, 1908-09, p. 115.	The main road runs through this circle and the stones may have been reset. There is no obvious grading, but the tallest stones are on the western arc.
2	Bandirran	NO/207310	9	In spite of several fallen stones, the largest appear to be on the western arc.	25' 4" × 27' 10"		
3	Blackfaulds	NO/145317	10		25' 6"	"St. Martins and Cambus-michael" by A. Scott, Perth, 1911, p. 38.	Most of the stones have fallen. Now difficult to say where the tallest has been. Scott says there were originally two circles in Blackfold Wood—a possible pair?
4	Colen	NO/115310	8	G. Largest stone to S.S.W.	14'	P.S.A.S., Vol. XXVI, 1891-92, p. 222.	The S.S.W. and S.W. stones are cup-marked.
5	Druid's Seat	NO/125313	9		30' approx.		Not apparently graded, but much disturbed and now heavily overgrown.
6	Fowlis Wester	NN/923249	10		19' 6"	P.S.A.S., Vol. XLV, 1910-11, p. 89; Vol. LXXVII, 1942-43, p. 174.	This circle has been much destroyed, but it seems likely that the largest stones were set in the S.W. quadrant. When excavated there were signs of cremation. In association with the structure were a ring cairn, two standing stones, cup-markings and deposits of white quartz.

No.	Name	Nat. Grid	Number of Stones	G=Graded Orientation of Tallest	Diameter	References	Comments
7	Moncreiffe	NO/133193	8	G. Largest stones on western arc.	27' approx.	P.S.A.S., Vol. XVI, 1881-82, p. 92.	This circle is suspiciously "landscaped," but may have been re-erected from a previous site. A large boulder with 19 cup-marks lies at the centre. This stone originally lay some distance outside the circle.
8	Monzie	NN/882242	9	G. Largest stones on S.W. arc.	17'	P.S.A.S., Vol. XVI, 1881-82, p. 89; Vol. XLV, 1910-11, p. 82; Vol. LXXIII, 1938-39, p. 62.	When excavated this circle was associated with cremation, "flat-rimmed" pottery and an outlying stone with an elaborate design of cup and cup-and-ring markings. At least one of the stones of the circle was also cup-marked.
9	Murthly	NO/103386	5	G. Largest stones on S.W. arc.	32' 6"	P.S.A.S., Vol. XLII, 1907-08, p. 158.	This circle has been "landscaped," but the stones are probably still in their original positions. The circle is now surrounded by a turf bank and a causeway leads to the centre.
10	Shian Bank	NO/156273	9	G. Largest stones on S.S.W.	24' x 27' 6"		These two adjacent and almost contiguous circles have been almost totally destroyed.
11			7	Largest stones on E. arc.	30' x 23'		
12	St. Martins	NO/160312	4	Largest remaining stones are to S. and W.	24' 6" approx.		Several stones are missing from this site.
13	Tullybeagles	NO/013362	12	G. Tallest stones on Western arc.	32'	P.S.A.S., Vol. XLV, 1910-11, p. 102.	These two circles are only 7' apart.
14			13		27'		

Discussion

It is a very great pity that so many of these circles of standing stones have been destroyed. It is the penalty of being set in rich agricultural ground. Nevertheless, certain features emerge from the survey. Siting is not consistent. While Fowlis Wester (No. 6) lies 800' above sea level others are situated at the bottom of river valleys. There seems a marked preference for 8-10 stones (8 out of 14); diameters seem confined to between 20' and 30'. Because of destruction, grading has been difficult to assess, but where this has been possible, the emphasis in height seems to have lain on the southern and western arcs of the settings. Where excavated the circles are associated with burial and in particular with cremation. At Fowlis Wester Mrs. Young commented on the shallowness of the sockets and this too is a feature of the excavation at Scone Wood. Cup marks seem to be an integral feature of this class of monument. Pottery falling within the "flat-rimmed" Late Bronze Age variety has been discovered at two sites, Monzie and Scone Wood.

The survey work in connection with this Appendix was carried out by members of the Archæological Section of The Perthshire Society of Natural Science.

APPENDIX II

REPORT ON CHARCOAL FRAGMENTS FROM EXCAVATION AT SCONE WOOD, PERTH

JAMES S. MURRAY, B.SC.(FOR.)

Department of Forestry, University of Aberdeen

General

The charcoal was in firm, irregular chunks varying in size up to about 1½" in diameter.

Sectioning

Untreated material crumbled into fine dust before the razor blade. Satisfactory preliminary sections were made, however, by smearing a prepared surface with nail varnish, sectioning by hand and mounting directly. Such sections showed detail of structure very well and there was little fragmentation of material. This method can be recommended when sections are needed quickly.

The method finally used was ordinary wax embedding. At first it was attempted to dehydrate the charcoal by drying off overnight in an oven at 58°C. This resulted, however, in cracking of the material. Finally, satisfactory impregnation was achieved by immersing directly into "Paraplast" and waiting until the air was expelled naturally and the material sank. The melted wax was transferred to cardboard trays and cooled abruptly by immersion in water and left there for half an hour. Sections were cut on the rotary microtome at 11μ thickness and mounted on slides using Haptas adhesive. Removal of wax was accomplished by four xylool changes followed by mounting in Canada balsam. The process was greatly simplified because of the lack of moisture in the charcoal and also because no staining was required.

Identification

Compared to conventional timber samples the charcoal presented difficulties in identification. In the majority of cases there was marked radial compression so that the shape of the vessels in the transverse section could not be seen. Lack of contrast in cell wall colour together with the impossibility of distinguishing pits in transverse section meant that the distribution and extent of vertical parenchyma could not be ascertained. Indeed, of all the tissue the parenchyma cells were most affected. In longitudinal sections the vertical parenchyma were either missing com-

pletely or could not be distinguished. The ray tissue also was destroyed in many cases. Although distinguishable in all transverse, in only a few cases could its detail be made out in longitudinal sections.

Some features were well preserved, however. Vessel arrangement was retained even where distortion due to shrinkage had taken place. Scalariform perforation plates, many complete and with readily countable bars, were present in most sections. Intervascular pitting could be seen in every case and was of the same type. In transverse section the uniseriate rays could be seen in all cases as well as the obvious rare aggregate ones. Aggregate rays were found only sometimes in longitudinal section, however, although the uniseriate rays were present in all cases. Good radial longitudinal sections were difficult to obtain. These showed homogeneous rays with well-defined pits to the vessels similar to the pits between vessels.

Section showed the features listed in Table 1. The common British species which are excluded by the particular features are shown alongside. Characters marked * could be seen in all sections.

Table 1.—List of Anatomical Features of the Wood.

Feature present	Species excluded
VESSELS:	
* Diffuse porous.	All conifers, oak, ash, elm, sweet chestnut.
* Arrangement in radial chains.	Rowan.
* Multiple perforation plates of ten with more than 20 bars.	Poplar, willow, rowan, sycamore, lime, cherry, hornbeam, horse chestnut.
* Intervascular pitting transversely oval, not minute.	Birch.
* Mean diameter between 50 and 100 μ .	
RAYs:	
* Uniseriate with the exception of sparse aggregate rays.	Birch, beech, hazel, lime, cherry, plane, holly.
Homogeneous.	Hornbeam, hazel, holly.
Pits from ray cells to vessels similar to intervacular pits.	Beech.

There were no differences which would suggest that different timbers were involved. There are also sufficient similarities to suggest that they are all the same. The lack of conifers and ring porous hardwoods is noteworthy. The universal presence of multiple perforation plates, radial vessel arrangement, one type of intervacular pitting, uniform vessel diameter and uniseriate rays eliminates practically all our common, diffuse, porous hardwoods except alder (*Alnus*) and certainly suggests that the choice of wood for the cremation was not fortuitous. All the above features are typical of alder timber as are also the last two features of the rays in the first column which were seen in only some cases.

A Carbon 14 test was carried out on the charcoal from the urn by Professor Kigoshi of the Faculty of Science at Gakushuin University, Tokyo. His findings are

Code No.	Age (years before 1950)
GaK 787	3150 \pm 150 1200 B.C.

The calculation is based on the Libby half life of C14, 5568 years, and the error quoted is calculated only from counting statistical error (standard deviation).

Salvia glutinosa, L., in Perthshire

A. W. Robson

Salvia glutinosa, L., known as Jupiter's Distaff or Clammy Sage, is a robust perennial herb with hairy glutinous stems arising from a rhizome, and moderately large cordate-sagittate leaves with acuminate apices. The largest leaves are at the base of the flowering shoot, the upper being smaller and giving the flowering ramets a pyramidal growth-form when fully extended. Flowers are borne in distant whorls on unbranched racemes, the corolla a lurid yellow and fairly conspicuous, the two stamens or style exerted according to whether the anthers have shed their pollen or not. Their most remarkable feature is, indeed, the pedal mechanism which assures transference of pollen from the ripe anthers to the backs of any large insects, especially bees, which, moving to an older flower which has already shed its pollen, come in contact with the arched style leaving the pollen adhering to the stigma. The fruit consists of the four nutlets characteristic of the *Labiatae*, one or two of which usually develop at the expense of the others.

In Notes from the Royal Botanic Garden, Edinburgh, I. C. Hedge says that "it is a very stable species varying remarkably little in its taxonomic features throughout its very considerable range. Likewise it is uniform in regard to habitat—damp places in deciduous or evergreen forests, usually montane, up to c. 1600 metres." It is indigenous in the Eastern Pyrenees, the French, Swiss and Austrian Alps extending eastwards through the Carpathians and the Balkan Peninsula, the Crimea, the Black Sea coastline of Turkey, the Caucasus to the Elburz mountains and beyond to its eastern limit in N.E. Persia. It is, moreover, also naturalised in several parts of Europe, presumably as an escape

from cultivation. It was introduced into Britain as a garden plant in 1759 and is included in the long list of *Salvia* species in the Royal Horticultural Society's Dictionary of Gardening, 1951. It has been reported as a naturalised alien from East Gloucester (1896), North Somerset (1938), and Oxfordshire (1958).

Immediately to the east of Caputh bridge and adjacent to the south bank of the River Tay there is an island approximately 650 yards long and about 100 yards at its widest point. The river flows strongly along the north side of the island over a shingle bed while the relatively narrow channel between it and the south bank of the river is in process of being silted up, a thickening scrub of Willow species with clumps of *Phalaris arundinacea* collecting more silt around their roots in periods of heavy rainfall and flooding. Most of the island is under a climax mixed deciduous wood and the ground flora is more or less stabilised. Towards the west the flora is less uniform; indeed there is a clearly demarcated area of shingle colonised by tree species mainly of Willow and Birch. On the 10th August, 1959, in the area between this prisere and the climax woodland about 15 feet above the level of shingle I discovered *Salvia glutinosa*, L., growing in dense shade in groups, the largest and westernmost of which, about 25 square metres, occupied a slight depression under a large Sycamore tree. Smaller colonies scattered over a distance eastwards of about 100 metres ranged from 6 square metres to single plants with one flowering ramet.

Upon enquiry I discovered this to be the first record for this species occurring in a wild state in Scotland and decided to make some general observations on it. Unfortunately, although visiting the site frequently, I did not find time to make these studies until the summer of 1964 by which time, however, it had become clear that the plant was entirely naturalised and may even have extended its range since 1959.

With the assistance of Mr. George Wilson, B.Sc., the whole area occupied by the species was mapped out in 10 metre squares using white posts as sighting rods. This map indicates the relation of the clones to the trunks of the larger trees and the more extensive shrub cover*, each separate clone being drawn in its actual plan with a count of the flowering ramets indicated alongside. There is no point in reproducing such a small scale map here but it will be lodged in the botanical section of the library in the Museum at Perth. By means of this map, however, it should be possible in the future to measure the spread of the species locally with some degree of accuracy or to note its demise if conditions should prove ultimately unfavourable. It was thought unnecessary to

* Two large bushes of *Physocarpus opulifolius* and one of *Symphoricarpos rivularis*.

make detailed measurements of the plants which obviously all derive from the same original introduction. However, in order to present some idea of the effectiveness of the basal leaves in over-shading other plants in July and August when the *Salvia* is in full flower, five of the tallest flowering ramets were selected. They were measured for height and found to average 37.6 inches of which the inflorescence occupied 12.6 inches. The breadth, taken across the widest pair of opposite leaves near the ground, averaged 15 inches. The shortest stem bearing a few flowers was 9 inches high. The rhizome travels just below the soil surface but adventitious roots were traced in two specimens to a depth of 6 inches.

Soil profile study reveals a homogeneous bed of damp river-laid sand resting on shingle as might be expected in the situation. Slight depressions circular or serpentine indicate, as does the debris caught in the forks of bushes and trees, the movement and height of floodwaters during winter. It is in these slight hollows that most of the clones seem to have originated. A very thin layer of fresh humus lies loosely on the surface and the A1 layer is visible to a depth of 2 inches only by virtue of the slightly darker coloration of the sand. These features and the relatively open nature of the plant community indicate clearly the immaturity of the soil and the colonising nature of the vegetation. Soil analysis (see Table) of five samples chosen at random over the spread of the plant to a depth of 2 inches and another five between 4 and 6 inches show pH values averaging 6.38 and 6.02 respectively. The percentage of dry matter in the upper level averages 83.46 and at the lower level 90.22. The soil characters thus indicate a very well-drained, slightly acid condition. Periodic flooding at certain times and a level of humidity and protection from drying winds during the plant's main period of aerial growth must be sufficient to maintain moisture in the upper levels of the soil and in the area of the leaves to prevent desiccation.

A Weston Master V light meter was used to ascertain the light value in the shade of the Sycamore and Ash, etc., which provide it. On a dull day in early October a reading was obtained in the open by pointing the meter in the sun's direction 60 cms. directly above a white card. Using the same methods, with the meter set at the same film speed, five other readings were taken, the white card being placed amongst the foliage of the *Salvia*. Calculations provide a percentage light value for the conditions prevailing in the five areas from which soil samples had been collected. The table brings together all the above data and indicates by a cross the presence of the species listed in April when the tree canopy was open and the flowering shoots of *Salvia* were barely above ground. By July, the foliage of most of them was considerably reduced, only the *Mercurialis* contending vigorously for the available light.

TABLE: Analysis of soil data, light values and floristic composition of sample areas occupied by *Salvia glutinosa*, L.

Nomenclature of Vascular plants according to Dandy (1958).

Sample Number	1	2	3	4	5
Sample Area in sq. metres	4	10	2	3	0.5
No. of flowering ramets of <i>Salvia glutinosa</i>	20	36	12	12	2
Soil pH at 0"—2"	6.4	6.2	6.7	6.4	6.2
Soil pH at 4"—6"	6.5	6.6	6.6	6.5	5.9
% Dry matter 0"—2"	87.6	74.9	91.4	84.2	79.2
% Dry matter 4"—6"	93.0	92.4	93.4	90.6	81.7
% Light Value	60.54	70.91	63.64	65.45	68.18
Tree canopy (*=mainly)	Ash* Sycamore	Sycamore	Ash* Alder	Elm	Sycamore Sapling Ash
Associated Species:					
<i>Aegopodium podagraria</i>	-	+	+		+
<i>Ajuga reptans</i>	-	-	+		+
<i>Anemone nemorosa</i>	-	+	+	+	+
<i>Angelica sylvestris</i>	-	-	+		
<i>Campanula latifolia</i>	-	+			
<i>Endymion non-scripta</i>	-	-		+	
<i>Geum urbanum</i>	-	+			
<i>Glechoma hederacea</i>	-	+	+		+
<i>Luzula sylvatica</i>	-	-		+	
<i>Lysimachia nemorum</i>	-	-		+	
<i>Mercurialis perennis</i>	-	+	+	+	+
<i>Oxalis acetosella</i>	-	+	+	+	
<i>Silene dioica</i>	-	+	+	+	
<i>Stellaria nemorum</i>	-	-	+	+	
<i>Symphytum tuberosum</i>	-	+			
<i>Teucrium scorodonia</i>	-	+		+	
<i>Urtica dioica</i>	-	-	+		+
<i>Viola riviniana</i>	-	+		+	+
<i>Atrichium undulatum</i>	-	-			+
<i>Brachythecium rutabulum</i>	-	-	+	+	
<i>Eurhynchium praelongum</i>	-	-		+	+
<i>Eurhynchium striatum</i>	-	-		+	
<i>Mnium undulatum</i>	-	+			
<i>Lophoclea cuspidata</i>	-	-			+

There can be little doubt that *Salvia glutinosa* arrived at Caputh by river agency. But when and from what source are difficult questions to answer. The problem of its spread also arises and further studies are necessary to ascertain whether the seeds are viable and if the smaller clones may have derived from them, or whether floodwaters are responsible for vegetative spread. Single specimens of *Lupinus polyphyllus*, *Aruncus sylvestris*, *Tolmeia menziesii* and an unidentified *Senecio* occur nearby and point to garden sources upstream. These however are casuals. The *Salvia* comes under J. E. Lousley's classification as a naturalised alien, which includes introduced species surviving in natural or semi-

natural habitats in full competition with native species. It therefore deserves serious attention. The author would appreciate any information leading to its detection as a cultivated plant in garden or estate, and invites careful search of the river banks and other islands upstream.

Acknowledgments. I should like to thank Mr. George Wilson, B.Sc., for assistance in the field, Mr. R. Mackechnie, B.Sc., A.L.S., for research into literature, Mr. I. C. Hedge, B.Sc., of the Herbarium, Royal Botanic Garden, Edinburgh, for his encouragement and showing me specimens from the species world range. My thanks are also due to Mr. Gavin Catto, B.Sc., N.D.A., and the staff of the Edinburgh and East of Scotland College of Agriculture for analysis of soils, and to Miss Ursula K. Duncan, M.A., F.L.S., for identification of the bryophytes in the associated species list.

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Perthshire Heronries

V. M. Thom

The Heron (*Ardea cinerea*) is a large and noticeable bird with a preference for social nesting and is therefore a suitable subject for census work. As it is highly susceptible to the effects of severe winters, when its feeding grounds on bogs and streams are icebound, and to gale and other damage to its nesting trees the population shows marked changes through the years, both in total numbers and in distribution. To date three attempts have been made to assess the Heron population of Great Britain. The first census, in 1928-9, was organised by "British Birds" and the later ones, in 1954 and 1964, by the British Trust for Ornithology. The results of these censuses for Perthshire are summarised in the Table opposite.

It appears from these figures that the Heron population of the county has decreased very considerably over the last 35 years. Many of the big, old-established heronries have been abandoned, often as a result of tree-felling operations, and there seems to be a trend towards small colonies of only one or two nests. In contrast

to this general trend the heronry at the Lake of Menteith has increased in size over the last 20 years. This heronry, the only one at present known in South Perth (that part of the county which falls within the Forth faunal area), alone accommodates as many birds as were nesting in the five small colonies found in North Perth (the Tay faunal area) in 1964. Three of these small heronries were recorded for the first time at the 1964 census, although it is now known that at least two of them had been in existence for some time. It seems highly probable that many more one and two nest heronries exist in Perthshire, but as a solitary nest is much harder to find than a colony and as many are likely to be in dense conifer plantations they have so far escaped notice. Any reports of Herons nesting anywhere in the county or of their presence during the breeding season would be welcomed by the Secretary of the Ornithological Section.

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E. A. Garden. *Bird Study* 5: 90-109, 1958.

Annals of Scot. Nat. Hist., 1908, 68: 220.

Table: Censuses of heronries in Perthshire.

Site.	No. of occupied nests.			Remarks.
	1928-9	1954	1964*	
Fincastle	?	3	6-7	6 nests with young in 1964.
Ochertyre	?	± 6	2-3	In high silver spruce. First recorded 1952—not new then.
Corb Glen	?	?	2	First recorded 1964—not new then. Robbed by crows.
Moncreiffe	?	?	1	First recorded 1964—not new then. 15 ft. up in willow.
Delvine	?	?	1	First recorded 1964.
W. of Forgan- denny Station	?	6	Extinct	14 in 1924. Abandoned soon after 1954 census.
Grandtully	?	5+	Extinct	Trees felled.
Glen Bruar	—	4	Extinct	Estab. 1954—bred then only.
Moneydie	?	± 3	?	4 in 1963—trees felled since.
Derculich	?	1	Extinct	Trees felled.
Loch Dochart	? occ.	?	Extinct	Large in 1871—abandoned some years ago.
Kirkmichael	± 12	?	? extinct	No recent information.
Clathick and Strowan	± 35	Ext.	Extinct	No heronry known in the area.
Rossie, Inchture	2	Ext.	Extinct	No herons in last 27 years.
Blair Drummond	? occ.	?	Extinct	Occupied in 1847 and 1934—abandoned many years ago.
Balquhider	?	?	? extinct	4 nesting singly in 1924.
Lake of Menteith	?	?	?	12-14 in 1965.
Total occ. nests	± 49	± 28	± 28	Assuming similar population at Lake of Menteith in both 1964 and 1965.
No. of occ. sites	3	7	6	
Average No. of nests per site	16	4	4.5	

* The assistance of all those who co-operated in the 1964 census is gratefully acknowledged.

The Recent Discovery in Perthshire of Two Bryophytes New to the British Isles

A. C. Crundwell

On 9th August, 1964, I found growing on disturbed ground at the foot of the Lochan na Làirige dam, near Ben Lawers, plants of the moss *Aongstroemia longipes* (Sommerf.) B., S. & G. and of the liverwort *Fossombronia incurva* Lindb., both of which are new to the British Isles.

Aongstroemia longipes is known from the Alps, northern Scandinavia, Iceland, Spitsbergen, Siberia, Greenland and arctic North America. It thus belongs to the arctic-alpine element of our flora. Its upright, slender shoots, usually less than a centimetre tall and with the leaves closely appressed to the stems, are individually most inconspicuous. At Lochan na Làirige, however, it is locally very abundant over several acres, and a bryologist could hardly have overlooked it there. But when, as it often does, it grows only as very small tufts or even as single stems, it can be very hard to find indeed. Its usual habitat is bare calcareous earth, sometimes alongside streams, and it may well be growing somewhere in the surrounding mountains and have been washed down to its present site. Only male plants are to be found there, and it has evidently spread within the area by means of its rather brittle shoots, which can act as units of dispersal.

Fossombronia incurva is much more limited in its distribution, being a European endemic known only from the northern plains of Germany and Poland and from a few scattered localities in southern Scandinavia. If it is a native British species it must be assigned to the continental element of our flora. It is a lowland plant, characteristic of moist, acid sand on the shores of base-poor lakes. It is very small (2-6 mm. long) and could therefore easily be overlooked. Moreover, it would hardly be collected when not in fruit, as ripe spores are generally needed to identify the British species of *Fossombronia*. It is a more surprising find than the *Aongstroemia*, but it may be that it is native somewhere in Scotland and that spores reached Lochan na Làirige by natural means. Alternatively it may have been introduced to the area from the Continent with men, machinery or material in connection with work on the construction of the dam.

Work on the dam site was finished in 1958. Before it began the ground was peaty and unsuitable for the growth of either species. Much or all of it may be expected to return gradually to peaty moorland, causing the two species to become less frequent, perhaps even to disappear altogether. It would be interesting to look for them on similar ground in the neighbourhood of other recently-constructed dams, for the movement of engineering contractors from one to another seems a likely way of dispersing them.

A fuller account of these two species and their discovery in Scotland is being published in the *Transactions of the British Bryological Society*.

A Celtic (?) Stone Head from Perthshire

Anne Ross, *Ph.D.*

A large stone head was discovered in the early Spring of 1965 by schoolboys, at Muirton, near Perth. The boys found it amongst a pile of stones in a field where it had presumably been placed after a plough had unearthed it. It is now on display in Perth Museum. Many stones of archaeological interest have been recovered in this way, from conservation cairns, or found built into walls and field dykes, their nature having either escaped the notice of their finders or its significance having eluded them (*Plates I and II*).

When heads of such a nature as the Muirton head come to light, the problem is always to find some reasonable criteria for placing them in a satisfactory temporal and cultural context. Found, as many are, in similar situations to the head under consideration here, divorced from an immediate archaeological setting which would allow of certain initial suppositions, we have to resort to dating and placing such finds on stylistic grounds, and this approach is one which must be used with extreme caution. Sometimes the lack of noteworthy characteristics will allow us to draw no firm conclusions whatsoever.

In the case of the Muirton head, all these problems must be faced, but here there are one or two factors which assist somewhat in the drawing of conclusions, namely, the distinctive style of the workmanship and the proximity of the find spot to archaeological sites into whose context it can be made to fit with ease. These factors will be discussed in order to demonstrate the likely date and cultural background of the head.

The head, which measures one foot in height, eleven inches across and four inches in thickness, represents a moustached male. The chin has been broken away and the right side of the head is also damaged. The treatment of the details is interesting and the



Plate I: Front view.



Plate II: Side view.

closest parallels to this stone are to be found in the huge repertoire of Romano-Celtic cult heads. The Celts worshipped the human head, using severed heads, which they preserved with herbs and oils, for display purposes in their homes and sanctuaries, and making representations of it in the form of heads and masks in stone, pottery and metals. For them it symbolised a range of divine characters, or the abstract qualities with which they believed the human head to be imbued—eternal life, independent of the body; healing and prognostic powers; divine other-world wisdom; the power of keeping evil forces at bay. The early literatures of the Celts, as well as the writings of the classics, abound in descriptions of practices connected with the human head, which are strikingly borne out by archaeological evidence. It is then to this great repertoire of representations of human heads and masks common to the entire Celtic world, and to the traditions concerning them, that we must look in considering the likely significance and relationships of the Perthshire head.

The head does not exactly resemble any single Celtic representation, but the individual portrayals of human features by the Celtic artists varies as much as do the features of real heads. But certain characteristics are widespread, and certain of these the Perth head can be shown to possess. The lower part of the face bears a close resemblance to that of a stone antefix from Gloucester (*Plate III, 1*) likewise moustached, and fractured below the mouth. Both heads have a similar scowling brow, emphasised by the fact that in each case the stone is deeply cut to form a jutting forehead. The eyes of both heads, although treated differently, have a fixed intensity of expression. The pupils of the eyes, however, are not shown in the case of the Gloucester head, while they are deeply drilled in the Perth head, to such an extent that it is possible they were originally set with pebbles and the eyeballs painted white, a common Celtic practice, with striking effect. The demarcating of the pupils varies in provincial sculpture of both Roman and native workmanship, and in the case of the native heads the eyes are sometimes given additional emphasis by means of multiple pupils. In considering the fashioning of cult objects in stone by native craftsmen in Roman contexts, we must always bear in mind the fact that this medium was not widely used by the Celts and that they borrowed freely, if not always with aesthetic success, the styles and techniques of the Romans to express their own religious ideas and personalities. The pupils of the antefix from Towcester (*Toynbee, No. 52*) are likewise sharply emphasised and the brow has a similar scowling appearance, increased by the staring eyes.

The most interesting feature of the Perth head from the native viewpoint, is the clearly demarcated ram-horn which curves along the left side of the head and stops about level with the cheekbone. The cult of a ram- or bull-horned deity is well-attested for North



1. Stone Antefix from Gloucester.

Plate III.



2. The Netherby Head.

Britain,¹ and in Roman times this divine type may be portrayed either as a full-length figure, frequently naked and armed, or as a horn-bearing head. Two horned heads from regions north of Hadrian's Wall have close affinities with the Muirton head. One, from Netherby (*Castra Exploratorum*), north of Carlisle (*Plate III, 2*) has slit-like eyes, again with deeply-drilled pupils and similar overhanging brows and scowling appearance. Powerful ram-horns are carved on either side of the head, the crown of which, again like the Perthshire head, is flat. The other head, from southern Scotland, and likewise horned, is in relief, the horns springing from the crown and not in the round at the sides. It comes from the Roman fort at Birrens (*Blatobulgium*), and is in the National Museum of Antiquities, Edinburgh.

Whatever the final opinion about the dating of this stone head from Perthshire, it is a fascinating find, cult objects from so northerly a region of Britain as this being somewhat rare. Its proximity to the Roman fort of Bertha, only two miles distant from the find spot, gives it a reasonable archaeological context and another feature, found nearby and well-attested in Celtic traditions, may likewise help to place it more firmly. The Celts venerated wells and also ritual shafts and pits. These they appear to have regarded as entrances to the other world and into them were thrown votive offerings of all kinds, including human and animal bones, pottery and weapons. Of significance is the fact that human heads were closely associated with them, actual skulls as well as representations of heads and masks having been recovered from such wells and pits, while the Celtic tradition is full of examples of such practices. It is perhaps noteworthy that close both to the Roman fort of Bertha and to the find spot of the stone head, at the point where the River Almond joins the Tay, a group of pits, of presumptive religious or funerary origin were found, of a kind well-attested for certain areas of the Celtic world.

The North Britons then, like other Celts, worshipped a horned god, bull- or ram-horned. They used the severed head as a symbol of the potent forces of the other world, and this they believed to be especially powerful as a healing or prognostic agent when brought into association with the forces of sacred waters. The combination of a head, a complete monument in itself, and bearing horns, in a region close to both a Roman fort and a series of pits of seeming ritual significance suggests that here we have an extension of this North British cult practiced by people who, with no tradition of sophisticated sculpting in stone behind them, used Roman techniques and representational ideas to express their traditional views of this divine concept. The Perth head may originally have stood on a pillar or have been set into the wall of some wayside shrine

¹ For a full discussion of the North Britons and a definition of North British territory, see *Feachem*, 1965.

where its powers would have been invoked, perhaps by those on their way to perform rites at the pits on the banks of the river nearby, or living in the fort, Romans and natives alike. For there is plenty of evidence to show that members of the Roman Army, heterogeneous as they were, were not at all anxious to antagonise the "gods of the place" and not only permitted them to be invoked, but, by comparing them to some member of the official pantheon, managed to do honour to both without disloyalty or the risk of retribution from the time-honoured gods of a hostile land. The cult is likely to have been brought from North Britain by soldiers serving in the Roman Army.

Comparative evidence thus allows us to suggest that in this head from Perthshire we are dealing with a piece of religious sculpture of native significance, but stylistically influenced by Roman provincial art, and of a date somewhere about the second century A.D.

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The photographs of the Perth head were taken by Mr. Malcolm Murray, Department of Prehistoric Archaeology, University of Edinburgh. I am indebted to Mr. Robert Hogg, B.Sc., F.M.A., Keeper and Curator, Tullie House, Carlisle for the photograph of the Netherby head, and to Mr. J. Neufville Taylor, F.M.A., Curator, City of Gloucester Museum, for the photograph of the Gloucester antefix.

Grey Geese in Perthshire

V. M. Thom and C. Murray

Every autumn approximately one third of the total British population of Grey Lag (*Anser anser anser*) and Pinkfooted (*Anser fabalis brachyrhynchus*) geese is found in Perthshire. Counts obtained at the Wildfowl Trust's annual November goose censuses are given in *Fig. 1*, which also shows the Perthshire numbers as a proportion of the Scottish population. Numbers in England at this time of year seldom exceed 500 Grey Lag and 12,000 Pinkfeet. The geese arrive in late September and October and settle down in fairly well-defined and largely traditional feeding grounds and roosts (see map). The main concentrations of each species tend to remain separate but mixed flocks occur on some feeding and roosting grounds, especially in the Strathearn, Carsebreck and Flanders Moss areas. During the winter, and particularly when severe weather occurs, many of the geese leave the county and move further south and west. After the hard winter of 1962-3 only a quarter of the autumn Pinkfoot numbers were still present in March and one third of the Grey Lags. Comparable figures for the open winter of 1963-4 were approximately 50% of each species remaining. By April migration is in progress and a substantial build-up of numbers again occurs, particularly on the River Tay in the Mugdrum area.

Disturbance at the roost by shooting naturally results in movements of geese to less disturbed areas and may produce marked changes in distribution. The big concentrations of Pinkfeet at Dupplin, where over 11,000 have been present in autumn, and of Grey Lags in the Blairgowrie-Meikleour area (over 8,000) are both of comparatively recent origin and are believed to have resulted from persecution at the Tentsmuir and River Tay roosts in the 1920s. At the present time the Grey Lags appear to be extending their winter range in the county. The numbers occurring in the Tay valley north and west of Dunkeld have increased from 200 to over 1,000 in the last four years and a party of about 30 has appeared at Ardeonaig on Loch Tay. Although Grey Lags often feed within one or two miles of the roost this is not invariably the case and some flocks travel over five miles. Where the principal roosts become overcrowded or where there is occasional disturbance by shooting the geese may resort to alternative roosts and these are frequently isolated hill lochs or reservoirs.

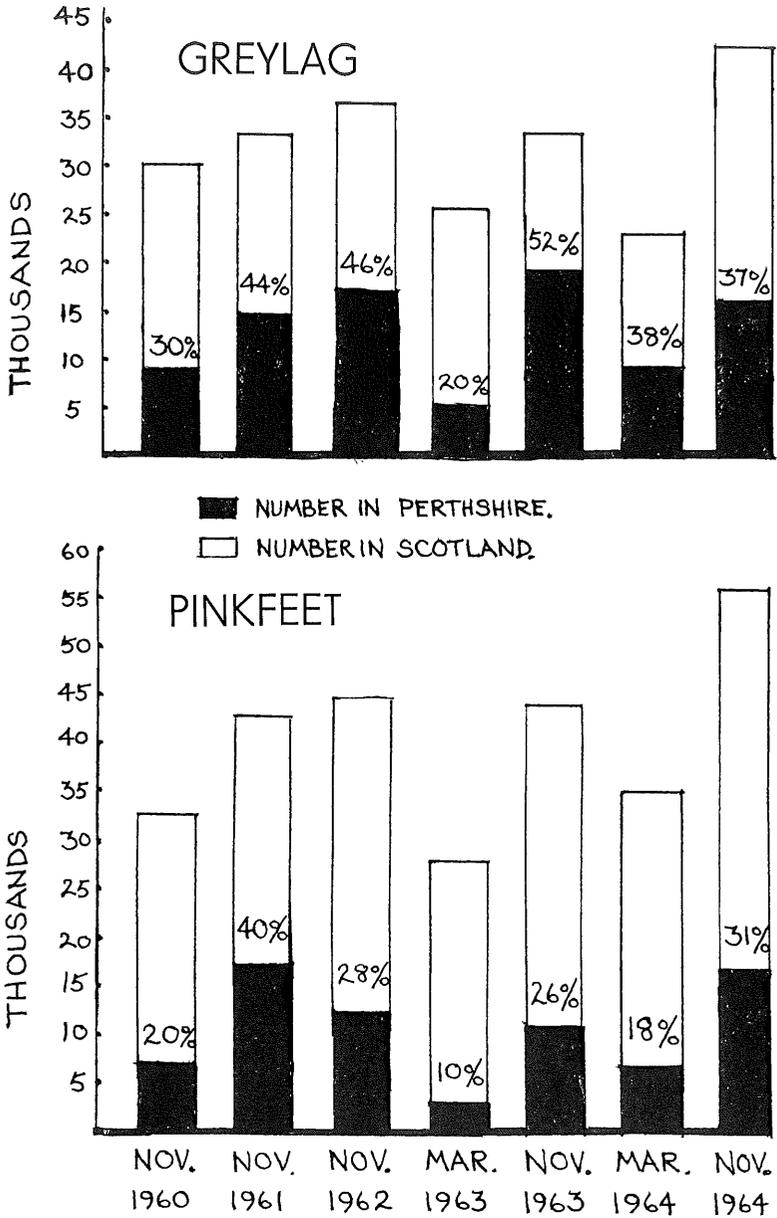


Fig. 1.

The distribution of Grey Lags and Pinkfeet in central Scotland follows closely the areas of most intensive cultivation of potatoes, barley and oats. The aftermath of these crops, chat potatoes left by the digger and shed corn on the stubbles, forms a major part of the birds' diet, which also includes grass from both permanent pasture and undersown corn stubble, young corn and occasionally turnips. The sight of locust-like flocks of thousands of geese descending on arable land not unnaturally causes considerable consternation in the agricultural community. The vast autumn flocks are generally seen on oat and barley stubbles and on potato fields, where their scavenging is on the whole beneficial, and the movement to young wheat and grass occurs later in the winter, by which time the total numbers of geese in the county have decreased and the flock size has also diminished. Recent work by the Wildfowl Trust indicated that little damage was in fact suffered by winter wheat since the geese graze the growing tips and seldom uproot the plants. A recovery in growth took place as soon as the grazing stopped and by harvest time little difference in yield could be detected. With young grass the position is rather different as the farmer depends on the "early bite" for lambing ewes and dairy cows and he cannot afford to allow the geese to graze the fields bare. Trials made with a variety of goose scarers have shown that whatever types of scarer are used it is essential to change their position in the field every 2-3 days, because as soon as the geese become familiar with an object or sound they are likely to ignore it.

In recent years the Wildfowl Trust's rocket-netting team has ringed and released large numbers of grey geese and recoveries of these marked birds have greatly increased our knowledge of goose movements. Within Perthshire alone 2,470 Pinkfeet were ringed in the years 1954-9. By February of this year 425 of these birds had been recovered; ten of them in Iceland, six in N.E. Greenland and the rest in this country. Of the British recoveries 188 were reported from East-Central Scotland (Perth, Angus, Fife, Kinross, Stirling and Kincardine), 92 from the Solway and the remainder from North Scotland (28), the Lothians and Berwick (36), Lancashire (23), the Humber (15), the Wash (26) and, a solitary record only, from Ireland. Pinkfeet ringed in most of these areas have been recovered in Perthshire as have several hundred birds ringed as juveniles or flightless adults on the breeding grounds in Iceland.

Ringling of Grey Lags has not been so extensive and only 715 birds of this species have been ringed in Perthshire to date. Although most of these were marked as recently as the autumn of 1963 there have already been 85 recoveries, including 12 in Iceland and one in Norway. Of the 72 British recoveries 49 were reported from East-Central Scotland (34 in Perthshire) and the remainder from North Scotland (8), the Lothians (4), Bute (3), Wigtownshire (6) and the Solway (2). Grey Lags ringed near Kinross (19) and Montrose (4) have been recovered in Perthshire.

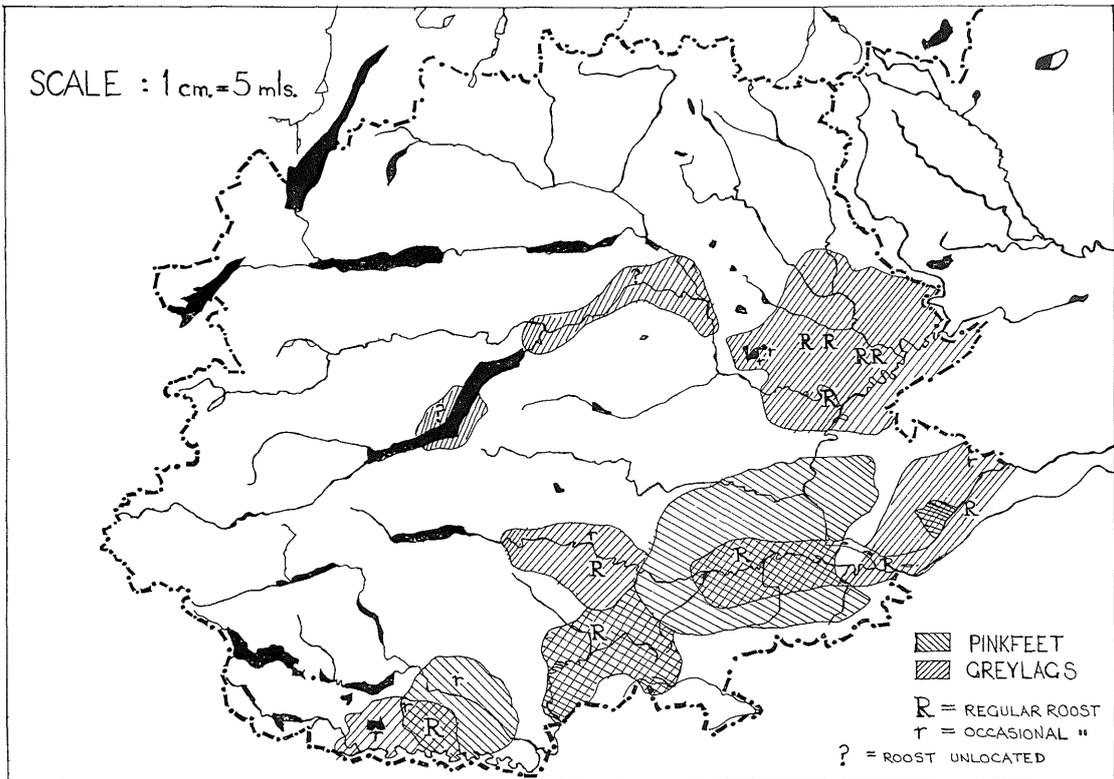


Fig. 2: Distribution of Pinkfeet and Greylags in Perthshire.

Solitary birds and small parties of other goose species are recorded annually as stragglers with the Pinkfoot and Grey Lag flocks. Where these individuals are easily spotted, as is the case with snow geese and, to a lesser extent, Barnacles, they can provide useful markers in following the local movements of flocks. They seldom appear, however, to have any great attachment to one particular population and may desert an area altogether although the original accompanying flock remains apparently undiminished. Possibly these "marker" birds are attached to comparatively small parties of grey geese which move independently within, and sometimes away from, the main populations. Details of the "straggler" records for the past two winters are given in the Selected Species List (page 44).

Acknowledgements. Most of the detailed information on which this survey is based was taken from unpublished figures kindly provided by Hugh Boyd and Malcolm Ogilvie of the Wildfowl Trust, Slimbridge.

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Helleborus foetidus, L., on Moncreiffe Hill

H. Carter

Helleborus foetidus is an uncommon plant anywhere in Britain, found most often in "woods and scrub on shallow calcareous soils and scree in south and west England and Wales," and is an introduced plant in all its stations in Scotland. The colony on the south face of Moncreiffe Hill is not mentioned in Hooker and Arnott's "Botany" published in 1855, but Buchanan White's "Flora of Perthshire" (1898) refers to the plant as growing there "in some abundance," having been sown. This suggests that the colony has existed for up to a hundred years, and it appears to be holding its own, having survived the felling of the mature deciduous woodland and the subsequent colonisation by ash and sycamore scrub.

The local conditions suit it well. It grows in company with ash and *Reseda luteola*, indicating that the soil is probably of the calcareous nature in which it is found as a true native, and it is sharply confined to the scrub-covered area of the hillside, the extent of its range from east to west coinciding exactly with the ash and sycamore. The slope where it grows consists of very unstable coarse soil, and the plant is well established near the top where the instability is not too marked, and scattered mature plants and seedlings grow on the lower slopes wherever they can find anchorage.

It is interesting to note that although so far north of its natural home it flowers on this sheltered southerly slope considerably earlier than its normal time, coming into bloom in some years as early as the third week in February.

The habitat may face a further change if re-forestation, already taking place on Moncreiffe Hill as a whole, should be carried into the area where the plant is established.

The Spread of the Collared Dove

(*Streptopelia decaocto*, Frivaldski)

Major A. M. M. Macfarlane

This originally Asiatic species has spread since 1900 from the Balkans across Europe and is now resident in most continental countries bordering the North Sea. It was first officially recorded in Great Britain in 1956 in north Norfolk, but investigation proved that it had bred at one site and been present at another in 1955. There was an explosive spread in 1957, when it was also found nesting in Kent, Lincolnshire, and Morayshire. In 1958, Hertfordshire was colonized and Essex and Northumberland also. Since 1959, the Collared Dove has appeared in many Counties of the British Isles and up to 1964 has bred in 34 English counties, 8 Welsh counties, 20 Scottish counties and 13 Irish counties, besides being recorded in many others. In fact, in some areas, notably the Isle of Thanet, the species has become almost a pest, competing with free-range chickens for food and waking people in the very early hours with their persistent calling.

The first report from Perthshire was of one bird at Faskally on 16th February, 1960 (S.B. Vol. 1 No. 8). After a gap of two years the next record was from Hamilton Place, Perth, where four birds established themselves in May, 1962. Two young birds were also seen later in the year and this is the first known breeding success. Birds have been present in the area ever since and have bred every year. Since late 1963, quite large parties of up to 26 birds have been seen in Hamilton Place, Perth, and at Balmanno Castle, Baiglie, whilst odd birds have been reported from elsewhere in Perth.

Outside Perth, in addition to the Balmanno Castle birds mentioned above, Collared Doves have been reported as follows:—

22nd May, 1963. Two birds at Ranagulzion, Bridge of Cally (S.B. Vol. 2 No. 6).

14th October, 1963. Two birds at Rattray, Blairgowrie (S.B. Vol. 3 No. 1).

From November, 1963. A single bird at Muthill.

From April/May, 1964. A pair at Longforgan, which nested and raised two young.

From October, 1964. A single bird at House of Ross, Comrie.

All local records, other than those extracted from "Scottish Birds," have been taken from personal correspondence received after a letter requesting information had been published in the "Perthshire Advertiser."

Birds of Perthshire: A List of Selected Species

P. F. James, Recorder, Ornithological Section

This list gives recent records, up to 31st March, 1965, of less frequent visitors to the County. The numbers in the left-hand column are those of the Check List of The Birds of Great Britain.

- 6 **Red-necked Grebe.** Loch Earn: one on 17th March, 1963.
- 7 **Slavonian Grebe.** Lake of Menteith on 8th September, 1964.
- 16 **Manx Shearwater.** Loch Tay: one on 3rd July, 1961 (first Perthshire record).
- 26 **Fulmar.** Stormont Loch: one picked up alive on 15th September, 1963 (first Perthshire record).
- 42 **Spoonbill.** Crieff: one seen on 16th July, 1964 (first Perthshire record); Rannagulzion, Blairgowrie: one juvenile seen on 28th October, 1964. This may have been the bird shot later near Perth; it had been ringed as a nestling in Jugoslavia on 22nd June, 1964.
- Mandarin Duck.** River Tay, at Perth. Free-flying birds from a local collection are seen regularly, and have bred ferally.
- 55 **Scaup.** Invergowrie: two drakes and a duck on 6th March, 1963.
- 71 **Smew.** Dunalastair: a drake on 11th April, 1964; Dalreoch, Dunning: a redhead on 14th December, 1964; River Tay, at Perth: a redhead on 3rd and 4th January, 1965.
- Grey Geese.** A separate article deals with their normal occurrence.
- 75 **Greylag.** Loch Faskally: birds released here bred in 1964, six adults and seven goslings being present in July, 1964 (two broods).
- 76 **White-fronted.** Crieff: five on 2nd November, 1963; Balgowan: one on 11th October, 1964; Forteviot: one, possibly European race, on 14th December, 1964; Meikleour: one, juvenile, on 14th February, 1965; Flanders Moss: one on 29th March, 1965.
- 78 **Bean Goose.** Perth: a bird hanging in Coull's, Poulterers, was shot at Carnie Pier, Glencarse, early in January, 1965.
- 79 **Snow Geese and Ross's Geese** (Summary by Miss V. M. Thom)—

Most of the Snow Geese recorded in Scotland are believed to be escapes from wildfowl collections, and this suspicion may often be confirmed by the presence of rings on the birds' legs.

The specific identification of Snow Geese in the field is generally difficult and often impossible. There have, however, been definite

records both of Ross's Geese and Greater/Lesser Snows in Perthshire during the last two years. The Ross's Geese, a ringed pair, are thought to be birds which escaped from Slimbridge in 1961, and are probably the pair that nested in Iceland in 1963, losing their nest in flood water. In the autumn of 1963 they appeared in Lanarkshire, Midlothian, and East Lothian, and moved north into Fife in December. By January, 1965, they were in Angus, and it is likely that the two white geese seen in the Meikleour area were these birds. On 6th November, 1964, the pair were identified at Monksmyre, Blairgowrie, and they were subsequently recorded several times in the Caputh/Spittalfield area. Since mid-December no further reports of their whereabouts have been received. Earlier reports of a pair of white geese with Greylag at Comrie in January and February of 1963, and at Spittalfield in March, 1963, may refer to the same birds.

Early in 1964 a single Snow Goose appeared with Greylag and Pinkfeet in the Baiglie straight area, and was seen on numerous occasions between 25th March and the 14th April. This bird was appreciably larger and leggier than the Ross's geese, and was most probably a Lesser Snow. The record of a bird at Kingoodie on 8th March, 1964, may refer to the same bird. A single bird was seen in the Bridge of Earn area in the first week of January, 1965, and possibly the same bird, a Snow Goose, was seen several times in the Meikleour/Monksmyre area in the last week of February, 1965.

- 80 **Brent Goose.** Balgowan: one on 11th October, 1964; Blackford: one on 23rd October, 1964.
- 81 **Barnacle Goose.** Carsebreck: one with Pinkfoot on 6th October, 1963; Forteviot: three with Pinkfoot on 19th October, 1963, and one with Greylag on 8th March, 1964; Comrie: three with Greylag on 13th March, 1964; Aberuthven: one with Greylag on 13th March, 1964; Monksmyre: one with Greylag on 7th November, 1964; Dalreoch, Dunning: one with Greylag on 17th December, 1964; Tibbermore: one with Pinkfoot on 24th January, 1965; Crieff/Comrie: twelve with Greylag were in this area from January to March, 1965; Inchture: one on 25th March, 1965; Forteviot: one with Greylag on 28th March, 1965; Baiglie: two with small party of Pinkfoot and many Greylag on 28th March, 1965; Flander's Moss: one on 29th March, 1965; Dalginross, Comrie: one on 31st March, 1965.
- 82 **Canada Goose.** Loch Tummel: two on 10th September, 1963; Kingoodie: three on 25th April, 1964; Loch Clunie: one on 29th April, 1964; Faskally: two adult birds with a gosling on 6th June, 1964—one adult was subsequently killed; Loch Tummel: two birds on 6th June, 1964. Both these pairs are known to have been released on the Lochs deliberately. Various birds from a collection near Comrie are free-flying, and have cross-bred.
- 93 **Sparrow Hawk.** Blairgowrie: one on 15th December, 1963; Balgowan: one, male, on 31st October, 1964; Glencarse: one on 18th March, 1965
- 103 **Osprey.** Loch Tummel: one seen carrying fish on 28th June, 1964; Aberfeldy: one on Tay in September, 1964.
- 117 **Quail.** Rannagulzion, Blairgowrie: one from 8th to 12th June, 1964.
- 120 **Water Rail.** Methven Moss: one, dead, in December, 1963; Kinnoull: one heard in December, 1963; Kingsmyre: three early in November, 1964.
- 125 **Corncrake.** Ardeonaig: one heard in June, 1963; Doune: one heard in June, 1963.

- 154 **Black-tailed Godwit.** This bird is now frequently reported in Tay tidal waters. However, it has recently appeared higher up the river. Port Allen: twenty-eight on 25th July, 1964.
- 156 **Green Sandpiper.** Port Allen: one on 15th August, 1963.
- 162 **Spotted Redshank.** Kingoodie: one on 23rd August and 8th September, 1964.
- 165 **Greenshank.** Port Allen: one on 23rd August, 1964.
- 169 **Knot.** Invergowrie: *circa* twenty in March, 1963.
- 193 **Arctic Skua.** Loch Rannoch: immature, found dead, on 8th October, 1964.
- 230 **Puffin.** Kindrogan: one picked up alive in April, 1964.
- 235 **Turtle Dove.** Perth: one with Collared Doves in autumn, 1964.
Collared Doves—see separate article.
- 258 **Kingfisher.** Pitlochry: one in 1964; Butterstone: one in 1964.
- 262 **Green Woodpecker.** Kinnoull: one in March, 1963; Dupplin: one in May, 1963; Aberfoyle: one or two in August, 1963; Dunkeld: one in June, 1963; Glenfarg: one in June, 1964; Dunkeld: one on 2nd November, 1964; Caputh: one in summer, 1964; Balthayock: two during February, 1963; Glencarse: one or two in February/March, 1965.
- 265 **Wryneck.** Perth: one, dead, in September, 1964.
- 293 **Willow-Tit.** Perth: one on 17th October, 1964.
- 296 **Nuthatch.** North Perth: one present from November, 1963, until February, 1964. A bird was seen again at the same place in October, 1964, until April, 1965.
- 383 **Waxwing.** A substantial invasion of Waxwings occurred in Scotland in the winter of 1963/1964. There were no reports for South Perth (Forth), but the following records were made in North Perthshire (Tay):—
- (a) Perth area: 8th November, one at Perth; 12th November, three at Methven Moss; 17th November, six at Perth; 6th December, one at Perth; 8th December, six at Perth; 9th December, three at Perth; 22nd December, nine at Barnhill; 16th January, eight at Perth; 3rd February, eight at Bridge of Earn; 22nd February, ten at Perth and six at Perth; 23rd February, ten at Perth; 24th February, one at Perth; 11th March, one at Perth.
 - (b) Other areas: 5th November, six at Kingoodie and up to four till 23rd; 9th November, they were first noted at Aberfeldy; 10th November, two at Loch Clunie; 30th November, two at Pitlochry; In November, two seen at Blair Atholl; 5th December, twenty-four at Pitlochry; 8th December, twelve at Rosemount, Blairgowrie; 15th December, eight at Butterstone and two at Butterstone; 17th December, four at Butterstone; 20th December, eight at Butterstone; 16th December, eight at Crieff; 18th December, twelve at Aberfeldy; 22nd December, one at Aberfeldy; 30th December, two at Aberfeldy; 3rd January, four at Aberfeldy, and some till the middle of the month; 16th January, eight at Invergowrie/Kingoodie; 17th January, one at Invergowrie/Kingoodie; 4th February, one at Invergowrie/Kingoodie; 9th February, four at Invergowrie/Kingoodie; 14th February, six at Invergowrie/Kingoodie; 26th January, six at Comrie; 27th January, twelve at Crieff.

Perthshire Vascular Plants: Records and Notes

A. W. Robson, *Botanical Section*

This selected list gives some of the more interesting recent records up to 31st March, 1965. The species are numbered in accordance with Dandy's List, 1958. The squares referred to are 10 Km. Squares of the National Grid, the unit employed by the Botanical Society of the British Isles in the Atlas of the British Flora (1962). F.P.=Flora of Perthshire, Francis Buchanan White (1898). C.T.W.=Flora of British Isles, Clapham, Tutin and Warburg (1962).

- 7/2 **Hymenophyllum wilsoni**. Wilson's Filmy Fern. Sept. 3rd, 1963; in a damp, shaded gully on Uamh Beag near Callander.
- 46/5 **Ranunculus arvensis**. Corn Buttercup. July, 1964; Bridge of Earn, solitary plant on garden path; a very local cornfield weed north of the Forth. There are no recent records of this species occurring in fields.
- 81/1 **Cardaria draba**. Hoary Pepperwort. June 25th, 1963; by railway sidings, Methven Station, one plant which has been known since 1959. First recorded in east Kent in 1809, common in S.E. England and occurring casually further north. This is a recent record for Perthshire, there being only one previous record at Invergowrie.
- 85/1 **Teesdalia nudicaulis**. Shepherd's Cress. May 3rd, 1964; excavated sandhill near Lundin Farm, Grandtully. A new square record; not recorded for Breadalbane in F.P.. Our northern plants appear to be much smaller than those further south, the tallest specimen here being 11.3 cms. Maximum size given in C.T.W. is 45 cms.
- 94/4 **Draba muralis**. Wall Whitlow-grass. June 25th, 1963; by railway track, Methven Station. A very rare casual in the north and a new square record.
- 97/3 **Cardamine impatiens**. Narrow-leaved Bitter-cress. June 7th, 1964; Methven, in a derelict garden. This is a plant of ash woods and limestone screes in the south, so that this record is of an introduction.
- 100/4 **Arabis hirsuta**. Hairy Rock-cress. June 2nd, 1964; on the friable sandstone adjacent to volcanic dyke at Damdykes, approximately twelve mature plants. This species was recorded from every district of the county in F.P., and this is a new square record.

- 124/2 **Lychnis viscaria**. Red German Catchfly. May 24th, 1964; Craigower, on the cliff ledges. Almost certainly Brebner's locality. There are several other stations in east Perthshire requiring re-detection.
- 190/3 **Medicago lupulina**. Black Medick. June 23rd, 1964; Pitroddie Quarry, on the levelled spoil-heaps growing with associates commonly found in dry habitats occupied by open communities of very small prostrate plants. This easily overlooked species has a curiously local distribution west of Gowrie and should be noted carefully.
- 192/10 **Trifolium striatum**. Soft Clover. July 30th, 1963; Kirkton of Mailer Hill, on dry scree slopes near the top. A new square record. June 23rd, 1964; Pitroddie Quarry, on summit of a spoil-heap with *Filago germanica* and *Aria caryophyllaea*.
- 241/1 **Tolmeia menziesii**. Pick-a-back Plant. Sept. 6th, 1964; one plant established by a secondary channel of the Tay east of Caputh bridge. A western N. American plant, reproducing by bulbils in the leaves, which is probably spreading in this area.
- 351/1 **Gaultheria shallon**. "Gaultheria." Aug. 11th, 1964; an old established colony by Loch Horn. Not hitherto recorded. Usually introduced as pheasant cover on peats or sands; surviving here in Forestry Commission land.
- 360/1 **Orthilia secunda**. Serrated Wintergreen. April 14th, 1963; Glenlednock, the sides of a small gorge near the dam. George Don recorded this species for Comrie. Sept. 3rd, 1963; Uamh Beag near Callander, in very small quantity. New square records.
- 372/2 **Anagallis arvensis**. Scarlet Pimpernel. July 30th, 1963; Kirkton of Mailer Hill, along sheep-walk and on dry scree slopes under open elder scrub. A species with a well-marked southern distribution, thinning out considerably northwards. It is very rare in Perthshire or perhaps fugitive only. A new square record.
- 421/1 **Chaenorhinum minus**. Lesser Toadflax. June 25th, 1963; by railway track near Methven Station. All previous occurrences have been on railway lines since its first record at Invergowrie Station prior to 1891; it was recorded for Methven in this year, but has unaccountably been omitted from the Atlas.
- 439/1 **Lathræa squamaria**. Toothwort. May 14th, 1963; Meikleour, by the Tay, growing on roots of Lime and Elm. Very near the northernmost limits to date and a new square record for a rare plant. Elm seems to be the commonest host plant according to F. B. White.
- 485/3b **Galium mollugo, ssp. erectum**. Hedge Bedstraw. July 7th, 1963; Craggan Braes, south of Bridge of Tilt, uncut bank above a hayfield. Only two plants were seen. Possibly the station, "Blair Athole" in F.P. An extremely rare species in Perthshire.
- 490/1 **Linnæa borealis**. Twin-flower. July 21st, 1963; old pine wood in Blairgowrie area. Certainly Sturrock's location in F.P. and known by the finder since 1961. While maintaining itself vegetatively, this little shrub flowers rather infrequently here.
- 491/1 **Lonicera xylosteum**. Fly Honeysuckle. June 2nd, 1964; near Dalrue bridge below steep bank, a very large thicket. A very rare species, native only in Sussex, its distribution map showing the typical scattered pattern of introduced plants. This is the first Perthshire record.

- 494/1 **Valerianella locusta.** Lamb's Lettuce. May 24th, 1964; Craigower, on cliff ledges, fine large plants. Not recorded for Highland Isla in F.P. and a new square record.
- 502/1 **Bidens cernua.** Nodding Bur-marigold. June 21st, 1963; Hare Myre. Confirmation of old record in F.P.
- 589/1 **Polygonatum verticillatum.** Whorled Solomon's Seal. July 16th, 1963; Craighall gorge; in dense, mixed woodland on steep slopes. As far as is known this is the first rediscovery of the station known to Balfour in 1829 (F.P.). This species is confined to a small area in Central Scotland, and a number of other early locations require re-detection.
- 593/1 **Lilium martagon.** Martagon Lily. April 12th, 1964; Inveralmond. Two colonies, the largest on the haugh by the river bluff in rich alluvial soil. This European mountain plant, believed to be native only in Surrey and Gloucester, and naturalised further north, is an old garden plant. First published record.
- 597/1 **Gagea lutea.** Yellow Star-of-Bethlehem. April 23rd, 1963; Woody Island, several small colonies. The species occurs scattered over the Inveralmond area. This must surely be the station referred to as North Muirton by McFarlane in F.P., yet the Atlas shows no record for the square.
- 625/2 **Epipactis helleborine.** Broad-leaved Helleborine. Aug. 23rd, 1964; Wharryburn by Dunblane. Not recorded in F.P. or the Atlas for this delightful little glen in square 26/79.
- 629/1 **Neottia nidus-avis.** Birds' Nest Orchid. July 16th, 1963; Craighall, in beech woods near the Castle. Another of Balfour's 1829 records confirmed.
- 663/68 **Carex muricata (=paireii).** Prickly Sedge. July 10th, 1964; Craggan Braes, south of Bridge of Tilt, on an uncut bank. A new square record for this very local sedge, one of the few species which grow on dry, grassy banks.
- 683/13 **Bromus lepidus.** Slender Brome. July 27th, 1964; Dunning, at the base of a house wall, one plant. Though very local and difficult to detect, this grass is actually widespread in areas of cultivated grassland in the British Isles, owing to its seeds being mixed in the past with the two important hayfield rye-grasses. A new square record.

Prehistoric Finds Acquired by the City of Perth Museum and Art Gallery, 1944-64

John C. L. Lyddieth, Assistant, Perth Museum

No paper or notes on finds presented to the Perth Museum have appeared in the Transactions of the P.S.N.S. since 1928.

The following list is of some of the finds presented during the last two decades. Unfortunately, the exact location of many of the finds is not known and only the general localities have been recorded.

John Asher's catalogue of Stone Implements in the Museum collection at Perth, remains a very good guide as to the state of the collection in 1921. Copies are available to students in the P.S.N.S. Transactions, Vol. VII, Part III, or as an offprint (14 pages and 4 plates).

Stone Implements: Scrapers and Flakes

- 3/1950 Scraper, found on Kinnoull Hill. It is 3.8 cm. long, pointed at one end, with sharp edges. Presented by Mr. Watt, Forestry Commission.
- 4/1952 Scraper with fine bulb of percussion on the flake surface. It is 7 cm. long, with one end pointed. Found on Boreland Farm Fearnan, and presented by Miss C. Campbell, Rose Cottage, Fearnan. Also found on the farm was a Whetstone (4B/1952) 6.7 cm. long.
- 12/1964 Worked flake of blue-grey flint, 4.3 cm. long, found on the surface on the water shed between Glen Derby and Loch Curran, Strath Ardle. (Nat. Grid Ref. NO/045600.) It is a combined scraper and knife whose point has been broken. At the lower end of the right-hand edge, a piece of the original cortex or outer skin of flint remains, and at this point there has been no deep retouching of the edge. The flint may, therefore, be unfinished and was possibly discarded because of the broken tip. On the flake surface the bulb of percussion is visible. Probably Bronze Age. Presented by The Forestry Commission (Scotland), East Conservancy.

Arrowheads

- 3/1944 A barbed and tanged arrowhead of yellow flint, 3.5 cm. long. The secondary flaking has produced a serrated edge. Bronze Age. Found on the farm of Wester Cultmalundie and presented by Mr. W. H. Sangster, West Cultmalundie.

- 23/1951 A barbed and tanged arrowhead, 2.4 cm. long, found in a field at Gellyburn, Murthly. The field adjoins the east bank of the Gellyburn, and lies north of the railway line about 900' S.W. of the road bridge over the stream. Bronze Age. Presented by Mr. Joseph Wilson, New Cottage, Murthly.
- 11/1956 An imperfect, Neolithic, leaf-shaped arrowhead, which is bifacially worked. It is 2.7 cm. long and 2.3 cm. wide. It was found on one of the tracks leading from the Monastery side towards the top of Kinnoull Hill. Nat. Grid Ref. NO/135230. Presented by Mr. A. Robertson, Dumfries.
- 23/1960 A barbed and tanged arrowhead, 1.7 cm. long. Bronze Age. Found in a garden at Muirhall Terrace, Bridgend, Perth. (Nat. Grid Ref. NO/125243.) Presented by Miss L. Hamilton.
- 11/1961 Tanged arrowhead, 5 cm. long, found near Burnside, Methven. (Nat. Grid Ref. NO/021249.) Presented by Mr. Andrew Glashan, Methven.
- 6/1962 A fine collection of stone implements formed by Mr. George Roberts, who lived at Cupar and later at Blairgowrie, Mr. F. Roberts of Selkirk, and Mr James Roberts, was presented by Mr. James Roberts, Balcairn, Auchtermuchty. It includes arrowheads and scrapers from the counties of Moray (Culbin Sands), Roxburgh, Selkirk, and Berwick. The arrowheads are mainly barbed and tanged Bronze Age types, but *petit tranchet* and leaf-shaped types are included. The scrapers are mainly small, button-shaped types, but there are several fine end scrapers. There are also a few microliths. Practically all are of unpatinated flint. There are a number of pebble hammer stones.
- 7/1962 — 7LW/1962. A collection of stone implements, including flint arrowheads and scrapers, mostly from unknown localities. Some French sites are represented. Presented by Miss Mary Boyle, Kindrochat, Comrie.
- 18/1963 A Bronze Age barbed and tanged arrowhead, found near the bank of the River Tay. (Nat. Grid NO/112256.) Length, 3.8 cm.; breadth, 2.3 cm. Presented by Mr. David Roberts, Perth.
- 14/1964 A barbed and tanged arrowhead, found in the garden at "Mayfield," in the Tulloch district to the N.W. of Perth. Length, 2.2 cm. Presented by Mr. R. B. Hamilton.

Stone Ball

- 17/1959 A carved stone ball, found at Franklyden Farm, Balbeggie. (Nat. Grid Ref. NO/2029.) Presented by Miss Marlene Menzies, Scone. The ball is decorated with three pairs of projecting discs, but the lines which divide up the surface of the ball are not very deeply incised. The ball has been polished and has a smooth appearance. The triangular spaces between the circles are not ornamented in any way. The greatest diameter of the ball is $2\frac{3}{8}$ ". There is clearly uncertainty regarding the date of some of these balls. A recent assessment is given in Piggott's "Neolithic Cultures of the British Isles," p. 332.

Stone Axeheads, Etc.

- 1/1945 A heavy axehammer with an hour glass perforation from East Hatton above Rattray. The axehammer is 10½" long, 3 5/16" wide, and 3 5/16" thick. It weighs 7¼ lb. and the diameter of the perforation at the top is 1⅞". One end of the implement is rounded, the other end is wedge shaped. Presented by Major Baillie, Perth.
- 36/1951 An axehead made from a dark, fine-grained igneous stone, 9.3 cm. long, 2.2 cm. thick, and from 2 to 5.2 cm. wide. It was found in a garden at 6 St. Leonard's Bank, Perth. Presented by Mr. William T. Pitkeathly.
- 4A/1952 Polished stone axehead, 8.5 cm. long, 1.8 cm. thick, and 5-6.5 cm. wide. Found at Boreland Farm, Fearnan, and presented by Miss C. Campbell, Rose Cottage, Fearnan.
- 8/1952 A flint axehead, with a transversely sharpened cutting edge obtained by removing a single transverse flake. Probably from a kitchen midden in Denmark or from Campigny, N.E. France. Length, 13 cm.; width of cutting edge, 5.3 cm. Presented by Mr. J. H. Maxwell.
- 2/1954 An unusually small, polished, unperforated artifact of a fine-grained, black, igneous rock, found at Glentilt Terrace, Perth. It has semicircular hollows approximately 1 cm. deep in the middle of both sides. Total length, 9 cm. Presented by Mr. A. Turnbull.
- 16/1959 Stone macehead made of granite. Diameter, 3⅜"; thickness, 2⅞". The central hour-glass perforation has a diameter at the top of 1½". Presented by Mrs. J. Henderson, Kinross.
- 5/1960 Axehead, found at Netherton Farm, Aberargie, near the river Farg. It is of a blue-grey, polished stone. There is a slight facet on each side, and the implement is 14 cm. long. Presented by Mrs. Morrison, Willowbank, Aberargie. The stone of which this axe is made may be similar to that from the axe factory site on Creag na Caillich, near Killin. The Museum has some axe factory debris from Creag na Caillich on loan from Mr. P. R. Ritchie of the Ministry of Public Building and Works. The flakes and chips have a white colour, due to metamorphosis caused by acid in the peat.
- 12/1960 This implement, found near the river Ericht, was described as a stone axehead. It was found one mile downstream from the Wellington Dump, and on the same side, i.e., between Blairgowrie and the confluence of the rivers Ericht and Isla. It is made from a black, igneous rock, and is 8.7 cm. long. A marked groove runs round the middle, almost certainly for the attachment of a cord or thong, which would have attached it to a haft or enabled it to be used as a weight. Since both ends are rounded and about the same size, it may have been used as a hammer stone. Presented by Mr. Ian Fair, "Carrick," Carsie, Blairgowrie.

Flat Axes

- 1/1946 Dug up at Drumlanrig near Comrie in the middle of the 19th century. Length, 13.9 cm.; width of the cutting edge, 9 cm.; width of the narrow end, 2.6 cm.; thickness, 0.85 cm. The

blade broadens gradually to the cutting end. The metal still preserves its characteristic lustre in places. There are four small, circular marks in the metal (diameter, 2mm.) as well as some pitting. There is scarcely any thickness of patina on the axe. Presented by Major J. Drummond Moray, Abercairny.

- 1A/1946 Found at Drumlanrig near Comrie about the middle of the 19th century. Length, approximately 16 cm.; width of cutting edge, which is curved, 7.7 cm.; width of the other end, 2.5 cm. This also is curved. Thickness is approximately 1 cm. The patina appears to have been removed, leaving numerous small pits in the surface of the metal. This type of axe was usually cast in an open stone mould. It belongs to the first part of the Bronze Age, and is the earliest type in the evolution of bronze axes. Presented by Major J. Drummond Moray, Abercairny.

Palstaves

- 1B/1946 From Drumlanrig near Comrie. The axe is 11½ cm. long; 2.8-4.4 cm. wide; 0.4-1.6 cm. thick; the last measurement indicates the deep stop ridges which only project about 1 mm. above the upper surface of the blade. The flanges are approximately 2.9 cm. wide. The width of the curved cutting edge is 4.4 cm. The surface is patinated. Presented by Major J. Drummond Moray, Abercairny.
- 1C/1946 From Drumlanrig near Comrie. Although patinated, some of the surface of this axe appears to have been partially cleaned. Length, approximately 14 cm.; thickness, 1.4-0.3 cm. The stop ridge is only slight, the axe tapering away from it towards both ends. The edge is slightly curved, and there is another curve 2.7 cm. nearer the cutting edge. They look almost as if two pennies had been sunk between the flanges, one on each side of the axe, the central section of their rims being visible. The flanges are marked, are approximately 4 cm. across, and curve slightly inwards. Height, 3.2 cm.; width of the curved cutting edge, approximately 5.3 cm. Presented by Major J. Drummond Moray, Abercairny.

- 9/1956 Found on Bowhouse Farm near Balbeggie. Length, 12.7 cm.; width, 2.8 cm.; thickness, 1.2-2.5 mm. It has no stop ridge. Only one flange remains, width 2.8 cm.; it is slightly bent towards the centre. The axe is covered with flaky, fawn patina, which has been partly scraped off. Width of the curved cutting edge, 5.5 cm. Presented by Mr. James McIntosh, Montague Cottage, Balbeggie.

Spearhead

- 1D/1946 Socketed spearhead from Drumlanrig near Comrie. There are two nail holes in the socket for securing a hafted handle. The socket appears from the outside to run all the way to the tip of the spearhead, although it is not hollow all the way. The last 4 cm. or so appears to be solid. The socket is broken below the nail holes. The present length is 13.9 cm. Two ribs are apparent in the spearhead, one on each side of the socket. They are partly hollow. Presented by Major J. Drummond Moray, Abercairny.

I should like to thank all those who have assisted my researches and who have verified information for me.

Society Activities, 1963-65

Office-bearers

1963 - 64

President	- - -	Dr. W. H. Findlay, M.B., D.P.H.
Vice-Presidents	- -	R. J. Brien; Miss B. Ferguson, M.A.; Mrs. M. F. Blair; Ian M. Thomson, F.R.P.S., M.B.O.U.
Secretary	- - -	Rendle H. Foston, M. Inst. Gas E.
Treasurer	- - -	Kenneth M. MacAlpine, M.A.
Librarian	- - -	William Davidson.
Editor	- - -	Capt. N. M. S. Langlands, M.A., D.Sc., R.N. (Retd.).
Members of Council		A. W. Robson, D.A.; Miss S. Brodie; W. Armstrong, F.P.S., A.R.P.S.; James Aitken; Mrs. F. Brown; Mrs. H. E. Carter.
Trustees	- - -	The Earl of Mansfield, B.A., F.Z.S., M.B.O.U.; Eric Annandale, T.D., B.A.; Robert Adam, O.B.E.

1964 - 65

President	- - -	Dr. W. H. Findlay, M.B., D.P.H.
Vice-Presidents	- -	Miss B. Ferguson, M.A.; Mrs. M. F. Blair; A. W. Robson, D.A.; Miss J. W. Brodie.
Secretary	- - -	Rendle H. Foston, M. Inst. Gas E.
Treasurer	- - -	Kenneth M. MacAlpine, M.A.
Librarian	- - -	William Davidson.
Editorial Sub-Committee		A. W. Robson, D.A. (Convener); Miss B. Ferguson, M.A.; Mrs. M. E. C. Stewart, Ph.D., F.S.A.Scot.
Members of Council		James Aitken; Mrs F. Brown; Mrs. H. E. Carter; Miss V. Thom; Miss Nan Miller; A. Bearhop.
Trustees	- - -	The Earl of Mansfield, B.A., F.Z.S., M.B.O.U.; Eric Annandale, T.D., B.A.; Robert Adam, O.B.E.

General Meetings

1963

- Fri. Oct. 11 "The Windward Islands—the Caribbean"—Dr. D. A. Allan, C.B.E., D.Sc., LL.D., F.R.S.E., F.M.A.(Edin.).
- Fri. Oct. 25 "Problems of the Scottish Landscape"—Dr. Donald McQueen (Glasgow).
- Wed. Nov. 13 "Handa and its Birds"—Mr. G. Waterston (Royal Society for the Protection of Birds).
- Wed. Nov. 27 "Plant Breeding"—Dr. North (Horticultural Research Institute, Mylnefield). Joint meeting with the Royal Horticultural Society of Perthshire.
- Fri. Dec. 13 "Wild Life Studies in the Remote Scottish Islands"—Mr. Christopher Mylne (The National Trust for Scotland).

1964

- Fri. Jan. 10 "Madeira"—Dr. Robertson (Dundee).
- Fri. Jan. 24 "Celtic Art"—Mr. R. B. K. Stevenson (National Museum of Antiquities).
- Fri. Feb. 7 "Sketching and Enjoying Birds"—Mr. Len Fullerton (Warden, Morton Lochs and Tentsmuir).
- Fri. Feb. 21 Members' Night.

- Fri. Mar. 6 "Climbing in the Pamirs"—Mr. Ken Bryan. Joint meeting with the Scottish Junior Mountaineering Club.
- Fri. Mar. 20 Annual General Meeting. Presidential Address by Dr. W. H. Findlay, M.B., D.P.H.
-
- Fri. Oct. 16 "Golden Eagles"—Mr. J. B. Murray (Royal Scottish Museum, Edinburgh).
- Tues. Oct. 27 "Pictorialism and Landscape"—Mr. K. A. Mutch, F.R.P.S.
- Fri. Nov. 6 "Field Studies and the Naturalist"—Mr. Bruce Ing, M.A. (Warden, Kindrogan Field Centre, Scottish Field Studies Association).
- Fri. Nov. 20 "The Bannockburn Project"—Film: "Castle and Country"—Mr. R. J. Prentice (The National Trust for Scotland).
- Fri. Dec. 4 "Ice Ages"—Miss Helen Nisbet (Grant Institute of Geology).

1965

- Fri. Jan. 15 "A Plant Hunter's Miscellany"—Mr. Peter Hutchison (Forgandenny). Joint meeting with the Royal Horticultural Society of Perthshire.
- Fri. Jan. 22 "Industrial Archaeology in Scotland"—Mr. John Butt, B.A., Ph.D. (University of Strathclyde).
- Fri. Jan. 29 Members' Night.
- Fri. Feb. 5 "Round East Africa"—Dr. D. A. Allan, C.B.E., D.Sc., LL.D., F.R.S.E., F.M.A.(Edin.).
- Fri. Feb. 19 "The Goosander and Red Breasted Merganser in Scotland and Their Relation to Salmon Fisheries"—Dr. D. H. Mills (Salmon Research Laboratory, Contin).
- Fri. Mar. 5 "Early Mining in Scotland"—Professor C. F. Davidson, O.B.E., D.Sc., F.R.S.E., M.I.M.M. (St. Andrew's University).
- Fri. Mar. 19 Annual General Meeting. Presidential Address by Dr. W. H. Findlay, M.B., D.P.H.

Archæological and Historical Section

The Archæological Section of the Perthshire Society of Natural Science was formed under the chairmanship of Mrs. M. E. C. Stewart, Ph.D., F.S.A.Scot., in 1948. At the inaugural meeting it was decided that the Section should have a pre-historic bias, but give scope for interest up to the 18th Century.

The Section is an active member of the Scottish Regional Group of the Council for British Archæology, the Summer School of which is attended by a percentage of members each year. In 1958, members of the Section helped to organise the first Summer School run by the Scottish Regional Group. This was held in Pitlochry, the subject being "Archæology in Strathtay."

At the beginning of each winter session a subject is chosen for special study, and amongst these have been a series of lectures given by Dr. Stewart on "The Pre-history of Crete, Egypt, and Mesopotamia"; "The Hittites and the Archæology of Asia Minor"; "Prehistoric Brittany," and "The Wessex Culture." Books on these subjects have been made available, by the kind co-operation of the County Librarian, to assist study. Besides these lectures, which have been planned to satisfy those with pre-historic tastes, a very wide field of interest has been provided for those whose tastes are more catholic. These have been on such varying subjects as "The Mediæval Settlement at Lix"; "Early Church Relics"; "The Scottish Castle"; "Excavations at Whithorn"; "The Cult of Wells," and "Roman Scotland."

Under the direction of Dr. Stewart, members have helped in excavations at Glen Cochill, Arnbathie, Dalnaglar in Glenshee, Kinloch Rannoch, Scone Wood (now the focus point of the new housing estate), and (in 1964) at Hennacher's Knowe on Kinnoull Hill. Members have also assisted at the Roman sites of Dalginross, a Gask Ridge Signal Station, and at Carpow.

In 1957, the Section undertook to become the Perthshire correspondents for the Archæological Division of the Ordnance Survey. This has entailed walking a given area and noting places and objects of historical and archæological interest, both known and unknown.

On several occasions items previously unknown have been discovered.

During the winter of 1964, evening classes on the Technique of Survey and Excavation were given under the ægis of Perth County Council Education Committee. To follow these up in a practical way the excavation of the circular enclosure on Hennacher's Knowe was undertaken. The Carnegie United Kingdom Trust very generously gave a grant towards equipment for this, and members look forward to using it in the field each year.

In the spring of 1965, Roman Signal Station No. 7 was excavated under the direction of Dr. Anne S. Robertson of the Hunterian Museum, Glasgow University, in an endeavour to find dateable material. Unfortunately, this was not forthcoming, but it is hoped further excavation at a later date will discover some.

Many places of interest have been visited during summer outings, and, so far as is possible, these are varied to suit all tastes. During 1965, members have seen the 18th century houses in Falkland village; explored Ballinbreich Castle; walked over Wallace's Road to Scott's View and Cairn Geddes; visited Kinrossie Well and Hatton Castle, and the Chapel of St. Fillan and the native fort at Dundurn.

The Section representatives on the Council of The Perthshire Society of Natural Science are able to help the parent Society by suggesting speakers on archaeological subjects for the General Meetings, and a member of the Section joins with the other sections on Members' Night by giving a short talk on some subject of general interest. Members have also given excellent talks on subjects close to their hearts at the Section Members' Night.

In 1963, the Section were able to give a helping hand in the formation of the very active Breadalbane Archæological Society, with headquarters at Aberfeldy. A joint meeting of the two Societies is held each year. This year, the two stone circles at Fowlis Wester were visited.

It is the aim of the Section to continue to help with Ordnance Survey work so long as it is needed; to work in the field under the direction of Dr. Stewart on Pre-historic sites; on further exploration of the Roman Road and Signal Stations along the Gask Ridge, and to continue to use its influence to save buildings of interest in danger of destruction. The Section is also helping in the listing of sites of Industrial buildings suitable for inclusion in the Industrial Archæological Appendix. This branch of Archæology is the newest comer, and is of great importance in saving machinery and instruments which could well be forgotten in this rapidly changing world.

Botanical Section

The Botanical Section was formally constituted in the Museum on 22nd November, 1957, with Capt. N. M. S. Langlands, M.A., D.Sc., R.N. (Retd.), in the chair. The proposal to form the Section was advanced by the Council, which accepted that its particular aims were in the spirit of a Society which had had a long association with botanical matters dating to its foundation, and principally through its first President, Dr. Francis Buchanan-White. Its object in general terms is the encouragement and development of the study of botanical science among the members of the Society with particular reference to the flora and vegetation of Perthshire.

Since its inception, the tradition of excursions to various parts of the county and adjoining regions has been maintained. The recording of occurrences of species and general note-taking proceeds at these meetings as in the past. Providing opportunity for the observation of the characteristics and habits of plants in their natural and adopted environments, the excursions incidentally introduce members to an immense range of habitats at close quarters and to the beauty of the local landscape. New members are made welcome and quickly learn the procedures to aid study, and are given advice and information freely by the more experienced. The Section is now in close touch with the Nature Conservancy's Biological Records Centre at Huntingdon. Many of the former records detailed in White's "Flora of Perthshire" are being followed up, and new records are being incorporated into national data of the distribution of British plants. The Botanical Society of the British Isles, of which the Society is a subscriber-member, was first in the field with this work, and the publication of the Atlas of the British Flora in 1962, admittedly incomplete, has shown that more detailed and intensive recording will be required for a long period to come.

Recently, the Section have embarked upon studies of an ecological nature—an analysis of the habitat factors affecting the environment of a single species of flowering plant (*Geranium sanguineum*, L.) with a view to defining the tolerance range of the

species in the local conditions where it occurs. These studies will produce their own results, but serve also to increase members' experience of laboratory techniques in relation to field work and the value of conclusions based on data and statistics.

Winter programmes are devoted to lectures, demonstrations, and experimental work in the broad fields of taxonomy and classification, plant anatomy and physiology, and are for the most part conducted by the members themselves. Invited speakers deal with their specialised subjects, and a film evening has become an annual event. A library of slides is gradually being built up for the use of members. The work of the previous season is reviewed at open meetings and the broad outlines of the following season's activities laid down. By the free exchange of ideas and in many other ways an awareness of the scope of botanical activity engenders interest and encourages individual members to undertake specialised studies of their own.

Conservation of the native flora and the noting of sites of special scientific value is an important part of the Section's concern. The collection of plants is discouraged and habitats disturbed as little as possible, specimens being taken for study only where necessary and never of rare species.

During the summer of 1963, day excursions were held to Glen Lednock (April—Mr. J. Aitken, leader) before the snows were off the hill; the Rock of Weem (May—Mr. A. Bearhop, leader); Ben Ledi by the Stank Glen (May—Mr. J. Aitken, leader), a joint meeting with members of the Committee for the Study of the Scottish Flora; and Glen Clova (June) under the leadership of Dr. D. A. Robertson of Dundee, who had given a lecture the previous winter on this interesting area. Members of the Junior Section and school-children studying botany took part in this meeting. The Blair Atholl area (July—Miss J. Stewart, leader) from the Games Park up the Banvie Burn was visited for the first time, and the area of Stormont Loch of pine-wood and marshland (July—Mr. I. Soane, leader) yielded some interesting records. Dollar Glen to Maddy Moss (August—Mr. A. W. Robson, leader) and Uamh Beag near Callander (September), again with the C.S.S.F. under Mr. A. Slack, broke new ground. The final day excursion explored the dip slopes of Moncreiffe Hill (September—Mr. H. Carter, leader) for fungi.

Evening meetings visited Woody Island (April—Mr. A. W. Robson, leader); Meikleour and Kinclaven (May—Mr. J. Aitken, leader); Balthayock Den (June—Mr. C. Murray, leader); the railway line from Methven Station to Tippermallow (June—Miss J. Stewart, leader), providing interesting botanising and new records. The deep gorge at Craighall (July—Mr. R. J. Brien, leader) was descended and a rich new area for further exploration discovered. Kirkton of Mailer Hill (July—Mrs. I. Carter, leader) provided some rare plants, and the final evening meeting ranged Tay banks to Insherrit (August—Mr. A. W. Robson, leader).

Winter meetings, 1963: Invited lecturers included Mr. A. Cram, B.Sc. For.(Ed.), Dip. For.(Oxon), whose subject was "Pollen Analysis," and Miss E. P. Beattie of Edinburgh, who gave an account of recent botanising in Scotland and Norway. Mr. B. W. Ribbons, B.Sc., A.L.S., of the Department of Botany, University of Glasgow, lectured on "Photosynthesis," and Dr. W. H. Findlay, M.B., D.P.H., President of the Society, discussed the photography of botanical subjects with a view to improving the quality of

photographic records. Several meetings were held organising the season's records, and Mr. G. P. Wilson, B.Sc., described botanically a visit to the Burren country, Ireland.

During the summer of 1964, day excursions visited the woodland at Inveralmond and the grounds of Dunkeld House (April—Mr. A. W. Robson and Mr. A. Bearhop, leaders) to view the historically important larches; the Grandtully area (May—Miss J. Stewart, leader) and Craigower (May—Mr. A. Bearhop leader), in both of which places rare species were detected. In May, the Section was guided round the Royal Botanic Gardens, Edinburgh, by Mr. Bissett, Assistant Curator, and the purpose of the new Demonstration Garden explained. Craig-na-challich (June—Mr. I. Soane, leader) proved damp but exciting; Tentsmuir (July—Mr. A. Bearhop, leader) and the Wharryburn near Dunblane (August—Mr. J. Aitken, leader) introduced members to some new species. A joint meeting with the C.S.S.F. (September—led by Mr. R. Mackechnie, B.Sc., A.L.S., and guided by Mr. A. W. Robson) studied the alien flora of the Tay at Lairwell and Caputh. A "Fruit Foray" (September—Mr. G. P. Wilson, B.Sc., leader), designed to develop knowledge of fruit forms, closed the full-day excursions.

The first evening meeting examined remains of earlier forestation revealed by the excavations for the laying of water mains across a field at Balgowan (April—Mr. R. J. Brien, leader). Balthayock cliff-face (April) and the Tay at Stormontfield (May—Mr. C. Murray, leader) provided excellent searching ground. The banks of the Almond from Dalcrue Bridge to the volcanic dyke (June—Miss J. Stewart, leader) and Arnbathie Moor and Pitroddie Quarry (June—Mr. C. Murray, leader) both produced new records. Loch Horn in the Fowlis Wester area (August—Mr. A. Bearhop, leader) studied an introduced species and the marsh vegetation. In addition to the field excursions, two meetings were held in the Laboratory of the Museum to study the Plant Families Labiatae (May—Mr. G. P. Wilson, B.Sc.) and Cruciferae (June—Mr. A. W. Robson) during which members dissected their own specimens.

Winter meetings, 1964: Mr. G. P. Wilson, B.Sc., dealt with basic plant anatomy and physiology during a series of four evenings devoted to: I—Plant Cells and Tissues; II—Leaf Structure; III—Stem Structure; IV—Root Structure. Members were engaged in the laboratory techniques of preparing their own sections, and learnt the use of the binocular microscope. Mrs. P. M. S. Brockbank gave an illustrated talk on "Farming in Hong Kong," and Mr. C. T. Bond illustrated his lecture on "Orchids—Native and Cultivated." A Taxonomic study of the genus *Carex*, by Mr. A. W. Robson, completed the winter programme of lectures. In addition, several meetings were devoted to the collation of plant records made during the previous summer's field meetings.

The Section owes its gratitude to many landowners and official bodies such as the Forestry Commission and the Hydro-Electric Board, who have granted access and shown sympathy and understanding for the object of visits.

Ornithological Section

Introduction

An Ornithological Section of the P.S.N.S. was formally constituted on 3rd April, 1963. The need for such a section had been recognised for some considerable time—since the disbanding of the Perth branch of the Scottish Ornithologists' Club—and the Council had made unsuccessful attempts in the two preceding years to find suitable leaders. In 1963 these emerged in the persons of Miss Thom, Major MacFarlane and Miss Haggart and such was the immediate success of their efforts that within one month of the formation of the Section the membership stood at forty-nine.

The aims of the Ornithological Section are:—

- (a) To promote the study of bird-life locally.
- (b) To instruct and encourage beginners in the art of bird-watching.
- (c) To assist in any way the various nation-wide projects of bird-study and bird protection.

Members are kept in touch with past and future activities and with the more interesting field observations by the periodic distribution of short, duplicated "bulletins."

Winter Meetings

Indoor meetings are held once a month (generally the second Wednesday) from September to March inclusive. Each winter programme has included two talks by specialists on particular species. In the 1963-64 session, Mr. A. Anderson spoke on "Fulmars on Eynhallow," and Mr. C. M. Young on "Shelduck." The following season, Dr. D. Jenkins described his studies of "The Red Grouse," and Dr. D. H. Mills dealt with "Goosanders and Red-breasted Mergansers in relation to Salmon Fisheries." One outstanding colour film has been shown each winter—the R.S.P.B.'s "Highland Birds," in January, 1964, and Mr. C. E. Palmar's film of "Golden Eagles," in October of the same year. Other visiting speakers, all of whom used slides or sketches to illustrate their theme, talked on: "Handa and its Birds" (George Waterston); "Sketching and Enjoying Birds" (Len Fullerton); "The Isle of May" (Miss N. J. Gordon); "Antarctic Birds" (Dr. G. M. Dunnet), and "Spitzbergen" (M. A. Ogilvie).

Members' Nights—incorporating records of bird song, identification quizzes, and the showing of members' slides and films—completed the winter programmes.

Excursions

Local Outings. During the first two seasons of the Section's existence these have been largely exploratory in nature and have been aimed at expanding our knowledge of the distribution of Perthshire birds and assisting the less-experienced members in the identification of local species. Visits for these purposes have been made to various local woodlands, rivers, and lochs.

It is many years now since a review of the birds of Perthshire was produced, and the Section plans eventually to attempt a comprehensive survey. As a beginning, members have already noted that Corn Buntings are much more widely distributed in the county than previously recorded. Winter flocks have been seen at Blairgowrie and Aberuthven, and singing males appear to be scattered over the area east of a line through Dunning—Methven—Bankfoot—Blairgowrie. There are also few previous records of Tree Sparrows, other than by the tidal reaches of Tay and Earn, but, during the winter of 1964-65, parties of up to 35 birds were reported from a number of inland areas, especially in the Blairgowrie—Meikleour district. Other recent records of interest are detailed in the "Selected Species" list.

Excursions outwith Perthshire. These have enabled members to see many species which are not native to the county. Visits have been made to Fowlsheugh, near Stonehaven, and the Bass Rock for sea birds; to Guardbridge and the Eden Estuary for waders; to Speyside for Osprey and Crested Tit, and to the Ythan Estuary for terns and sea ducks.

Special Enquiries. Members of the Section have taken part in the following national enquiries:—

(a) A Census of Heronries, organised by the British Trust for Ornithology, in April 1964—the results of this are summarised in a separate article.

(b) Censuses of Geese on 8th November, 1964, and 28th March, 1965. These counts form part of a long-term study by the Wildfowl Trust into changes in the numbers and distribution of grey geese in Great Britain. The present position in Perthshire is reviewed in a separate paper.

(c) Wildfowl Counts. Individual members have assisted with the counts of Wildfowl organised on a nation-wide scale by the Wildfowl Trust. The monthly counts of wintering birds, which have extended over a number of years, have already been used in the Nature Conservancy's Monograph, "Wildfowl in Great Britain," and the scope of the enquiry has now been expanded to include a similar survey of breeding and summering distribution. The large number of lochs and rivers in Perthshire will provide opportunities for study for a long time to come.

Photographic Section

The Photographic Section continues to have as its aim the encouragement of interest, study, and practice in photography of all kinds. The Section attracts a large membership—up to 70 each year. Those interested in colour photography are increasing in number steadily, but there is still a small group which has as a main interest monochrome photography. The comparative ease of acquiring the techniques of taking colour transparencies has brought this form of photography well within the reach of the average Society member, whether he be attached to the Photographic Section or some other. Consequently, this Section has not been called upon so much for help in recording finds, etc., by other sections as in its early days. Pictorialism in all its various forms has become an attraction to many of our members, and aspirations in this direction have been reflected in the Section syllabus as it has appeared in recent years. Here we have the names of well-known pictorialists, some of them from as far afield as London, talking about such subjects as portraiture as well as other aspects of pictorialism. The large photographic firms such as Kodak, Ilford, and Johnson also give assistance by sending speakers under their lecture service.

Competitions are held within the Section and between the Section and other clubs in Scotland. The judging in most of these competitions is based upon pictorial merit, but in the others, record value comes first. In these latter, the City of Perth and its buildings have been the set subject. A considerable number of photographs of the city as it is in our day has been acquired in this way.

Practical instruction in photographic methods, from the making of the exposure to the finishing of the final print, is given to beginner members. These can also have the use of the dark room, which is available during the times when the Art Gallery is open to the public.

Summer outings of the Section are limited to two in number—a full day's outing, usually in the west or north-west of the county, and an evening excursion, usually in the south-east or east.

The Section is affiliated to the Scottish Photographic Federation and the Royal Photographic Society. Through the former there is a further link with the Photographic Alliance of Great Britain.

During the past three years, the Section has suffered loss through the death of Mr. P. K. McLaren, A.R.P.S., F.I.B.P., who was a staunch supporter of the Section, as well as of the parent Society of Natural Science, for many years. He was President of the Section for a three-year term from 1953, when it was re-constituted after amalgamation with the Perth Camera Club. Mr. McLaren was a professional photographer of wide experience, and this, combined with his enthusiasm, which equalled that of the keen amateur, made him the ideal consultant for all members.

Our second loss was through the death of Mr. Ian Thomson, a bird photographer of high merit and a Fellow of the Royal Photographic Society. Although his membership lasted only a few years, his knowledge, which he readily communicated to others, was a great source of help to the club members.

Thirdly, Mr. William Armstrong, F.P.S., A.R.P.S., a constant source of advice both in the pictorial field and in the chemistry of photography, was lost to us when he left the district to take up an appointment in England. And finally, our immediate Past President, Wing-Commander R. N. Lochhead, a photographer of long experience and wide practical knowledge, also ceased to be a member on leaving the district. The loss of such a wealth of talent in such a short space of time would be a serious blow to any society, but we have survived, and, if the recruitment of new members is any measure of the success of the Section, we continue to do well. Our services are always at the disposal of other sections for recording purposes or advice on photography of all kinds.

The current President is Mr. James Grant, who brings with him first-hand knowledge of photographic reproduction, being by profession manager of the process engraving department of a printing firm.

The Secretary is Mr. Wm. Johnston. One year ago he succeeded Mr. Thomas Calder, who gave many years of faithful and devoted service to the Section.

Children's Essay Competitions

For the Charles MacIntosh Memorial Prizes

1964—Subject: "A Ramble in the Country."

Entries: 97.

Prizewinners: Section I—First, Fiona Kennedy.

Section II—First, John Houston.
Second, John Cook.
Third, David Ritchie.
Fourth, Ian Moyes.

Section III—First, Philip Scott.
Second, Drew McLagan.
Third, James Davidson.

Sections IV, V, and VI—No awards.

Adjudicator: Mr. George Wilson, B.Sc.

1965—Subject: "Life in a Pond or Stream."

Entries: 29.

Prizewinners: Section I—No award.

Section II—First, Claire Wilkinson.
Second, Jill Southwood.
Third, Gordon Stewart.

Section III—First, Maureen MacDonald.
Second, Neil Fraser.
Third, Graeme Steel.

Sections IV, V, and VI—No awards.

Adjudicator: Mr. James Cradock, B.Sc.

Note: Section I—Competitors under 11 years of age.

Section II—Competitors over 11 and under 12 years of age.

Section III—Competitors over 12 and under 13 years of age.

Section IV—Competitors over 13 and under 14 years of age.

Section V—Competitors over 14 and under 15 years of age.

Section VI—Competitors over 15 years of age.

The Subject of the Competition is usually announced
in April of each year.

The City of Perth Museum and Art Gallery

The Museum contains representative collections of the fauna, flora and petrology of Perthshire, as well as an index collection of general natural science. The Museum is open:—

Weekdays - - - - - 10 a.m. to 5 p.m.

Wednesday and Friday evenings - 6 p.m. to 8 p.m.

Sundays - - - - - 2 p.m. to 4 p.m.

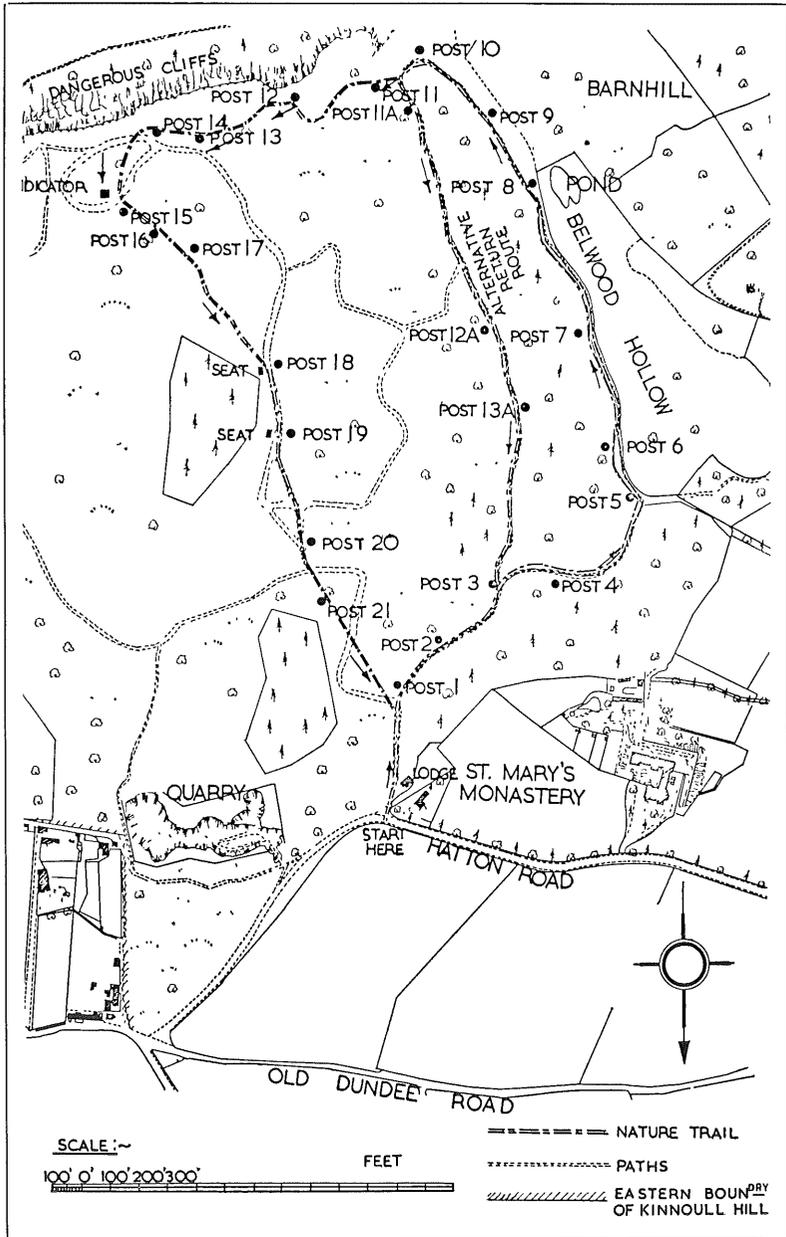
Sections normally meet three Wednesday evenings per month.

Back Numbers of Transactions and Proceedings of P.S.N.S.

These are stored in the Museum, and most parts are still obtainable. They cover the years 1883 to 1954. Please write to the Editor, c/o Museum, Perth.

Meteorological Observations, Perth

Figures have been published in previous volumes of the Transactions and Proceedings which cover the period from 1883 to 1953. Later figures can be obtained from the Curator at the Museum.



Kinnoull Hill Nature Trail

The Nature Trail was prepared by members of the Society and opened on 23rd April by Ex-Bailie Calderwood at the beginning of National Nature Week, 1966. The brochure describing the Trail can be obtained at the Museum, price 6d.

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