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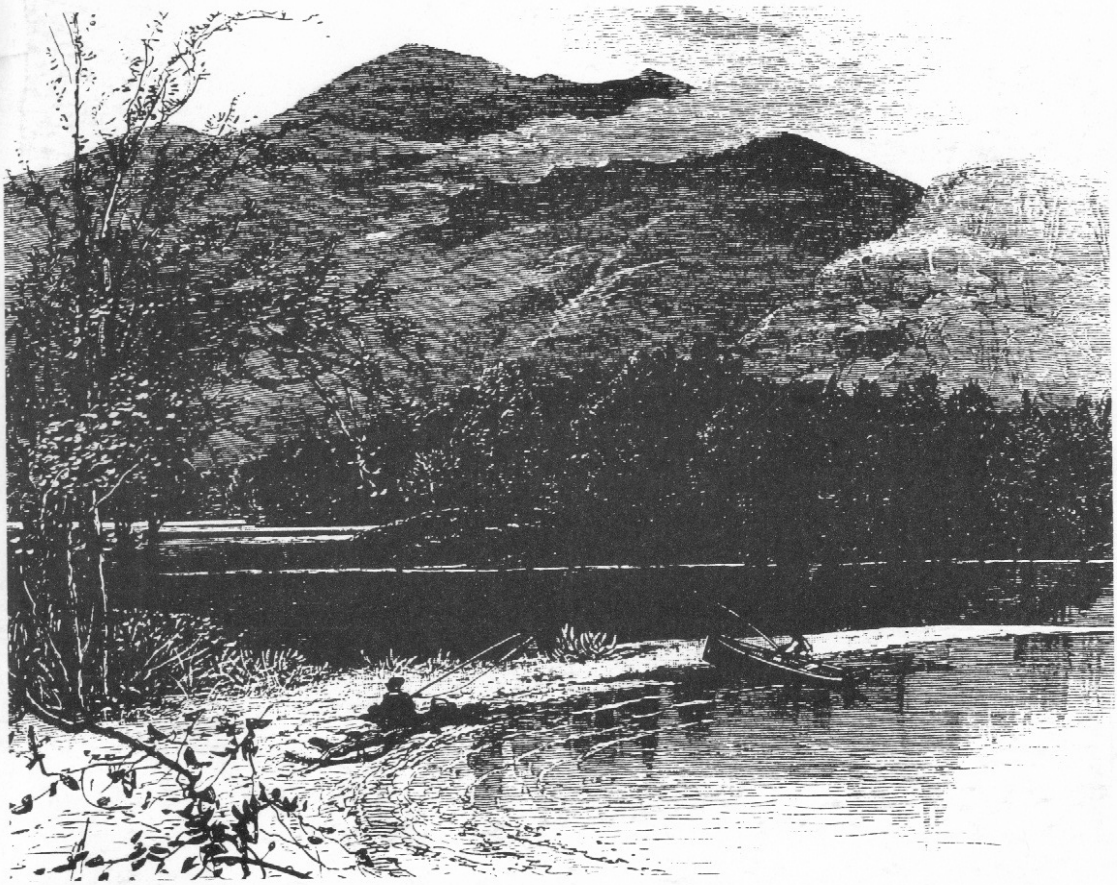

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ANNUAL CLIMATOLOGICAL BULLETIN No. 12 1990

S. J. Harrison University of Stirling

THE WEATHER OF 1990

1990 had the highest globally averaged temperature on record. The global warming debate continues! In Stirling, monthly mean maximum temperatures were above the long-term average for every month with minima at or above average for eight months. The year started with one of the wettest three-month spells on record in western Scotland but subsequent months were generally drier than average with some remarkably hot and dry spells in May and August. Strong winds were again a feature causing widespread damage across the British Isles in January, February, September and December. Accompanying snow disrupted road travel in Scotland in February and December.

Temperature and rainfall values referred to in the following have been taken from Stirling Parkhead unless otherwise stated.

January. Mild and wet. Very windy at times.

With pressure generally low in the vicinity of Iceland and high to the south of the British Isles the Scottish weather was dominated by a fresh to strong south-westerly airstream for much of the month. A seemingly endless sequence of frontal troughs brought extended periods of dull wet weather which became unpleasantly blustery in the second half of the month. Air frosts were, on the whole, only slight and occurred as weak ridges of high pressure cleared night skies. The first of several intense depressions brought storm-force winds between the 16th and 17th but on the 25th as a depression was centred over Scotland the strongest winds were experienced over southern England where there was extensive storm damage. With pressure increasing in the western Atlantic from the 22nd cold arctic air was drawn into Scotland and snow fell between the 23rd and 26th.

February. Mild and very wet

Unsettled weather continued with gale-force winds an increasingly frequent occurrence. At Parkhead rainfall exceeded 1.0mm on 26 days and 5.0mm on 17 (20 at Bridge of Allan). The first of the heavy rain fell overnight between the 3rd and 4th and the 48hr total was 30.8mm at Parkhead (43.0mm at Bridge of Allan). Exceptionally mild south-westerly air maintained the night temperature at 9.5°C on the 5th. As the wind veered to the north-west late on the llth the rain turned to sleet followed by

snow. By the 15th a little less than 2cms had accumulated on low ground. However, heavier falls in strong winds caused problems on many higher roads. Daytime maximum temperature reached only 3 • 0°C on the 13th. A ridge of high pressure cleared away the clouds on the 15th and night temperatures fell to the month's lowest (-5-4°C) by the evening of the 16th. Mild wet and windy weather returned early on the 17th when the River Allan briefly overtopped its banks as hill snows melted rapidly. Continuous heavy rain fell on the 23rd and 24th and by the evening of the 24th the Allan had risen to give the worst of the winter floods. An intense low (centre 952mb) to the north of Scotland brought storm-force westerly winds with overnight rain on the 25th/26th and the Allan flooded yet again. In the wake of the depression winds went round towards the north-west and temperatures fell quickly. Snow showers occurred between 26th and 28th although very little lay on the ground.

March. Mild and wet again but less windy

While pressure remained high to the west temperatures were low in a cold northerly airstream which brought snow on the 1st and the month's lowest early morning temperature (-3-2°C) on the 2nd. As high pressure drifted south the wind backed to westerly and milder wetter weather returned until the llth when a weak ridge moved quickly eastwards across Britain clearing away the cloud and rain. High pressure established over western Europe brought Scotland into mild south-westerly air from the 12th. Although the weather was dull, rainfall amounts were small. The weather remained unsettled until the 24th when pressure began to rise to the west of Ireland. Temperatures fell sharply and rain began to turn to sleet and snow showers. These died away by the 25th and pressure drifted slowly upwards over the rest of the month. Although the weather was dry, when the cloud cover cleared night temperatures fell to below freezing on the 26th and 28th. As high pressure moved slowly eastwards by the 31st, Britain was brought into a very mild southerly airstream.

April. More settled. Cold at times

As a weak low moved north-eastwards across Scotland the weather remained dull and wet on the 1st and 2nd. A cold north-westerly in its wake was associated with lower temperatures with light snow showers and night frost (-2-6°C) on the 3rd. After two dull and wet days high pressure became established over Britain and the 7th and 8th were bright and sunny. The high retreated south-westwards from the 9th and a series of active frontal systems dominated the weather over the next week. By the 15th pressure had begun to increase to the west of the British Isles and the wind veered towards the north-west. The weather turned cold with hail

and snow which lay as low as 150m OD on local hills. A shallow low lay over England on the 19th which set off isolated thunderstorms. High pressure moved southwards across Scotland from the 20th and the remainder of the month was generally dry but with some dull periods. Dense fog on the 23rd and 24th cleared to give two sunny and warm days. By the 30th high pressure covered the whole of the British Isles and the maximum temperature topped 20°C (22.2°C) for the first time in 1990. April was, on the whole, a dry month. It was the sunniest on record in London and drought in north-east Scotland led to soil erosion problems.

May. Warm and very dry

An anticyclone lay to the east of Britain over the first four days which were dry and very warm, exceeding 25°C on the 4th. Weak lows developed over Scotland on the 5th which brought cloud and rain. During the afternoon of the 7th very heavy rain fell in a heavy thunderstorm which dumped 23.7mm on Bridge of Allan but only 9.8mm on the University, only a short distance away. Showery rain persisted in the unsettled conditions until the llth when they were suppressed by a weak ridge of high pressure and the next few days were sunny after dull early mornings. A shallow Atlantic low with associated weak fronts moved in from the west late on the 14th and the 15th and 16th were dull and damp with low cloud shrouding the hills. High pressure again extended southwards across Scotland on the 17th. While this killed off the rain, the cloud cover persisted although it cleared away during the afternoons. A weak cyclonic system moved into Scotland from the north-west late on the 21st bringing a little rain but by the 23rd pressure had again begun to rise and warmer weather returned. This stayed until the evening of the 28th when unsettled weather returned. Over much of the southern half of Britain May marked the end of an exceptionally warm, sunny and dry spring.

June. Cool and very wet

June saw a sudden change in the weather and the mean maximum temperature was actually lower than the previous month while the sun was only an occasional visitor. A sequence of shallow lows to the north of Scotland, together with their associated fronts, dominated the weather for the first nine days. Exceptionally heavy rain fell in gale-force winds on the 6th, the wettest day of the month, and some of the showers on other days became heavy, with thunder occurring on the 8th. High pressure approached from the west on the 10th and the days became sunny and warm after strato-cumulus had cleared away. Pressure began to fall on the 17th as a depression moved in from the north-west, which heralded a return to less settled weather, although daytime temperatures remained in the vicinity of 20°C until the 24th. Periods of rain were interspersed with

occasional long sunny spells but rain was registered on all but two *days* in the second half of the month. *As* high pressure extended northwards over the Atlantic to the west of Ireland, northerly polar air lowered daytime temperatures for the remainder of the month, reaching only 15.0°C (monthly average 17.5°C) on the 29th.

July. Unsettled at first but becoming warm and dry

High pressure remained tantalisingly close to south-west England for the first nine days but most of the British Isles experienced generally unsettled weather with rain in a fresh westerly airstream. A depression and associated fronts moved quickly eastwards across southern Scotland on the 3rd and 4th bringing the month's wettest period (48hr total 13.8mm). As pressure at long last began to build from the south-west after the 10th the next three days were dry but remained cool in a fresh to strong westerly breeze. As high pressure drifted eastwards from the 13th Scotland was brought into a much milder southerly airstream and daytime temperatures began to rise to exceed 20°C on the 14th for the first time since mid-June. Occasional weak fronts brought periods of generally light rain but on the whole the days up to the 27th were warm sunny and dry. Maximum temperature exceeded 25°C on the 26th at Parkhead but topped this on no less than 8 days in Bridge of Allan. A complex area of low pressure began to develop to the west of Ireland by the 26th and rain fell late on the 27th as weak frontal systems drifted slowly eastwards across Britain. However, high pressure was never far away and warm weather returned again on the 30th.

August. Hot at first becoming warm and dull

This was a month when both temperature and rainfall records were broken in a remarkably hot and dry England and Wales. In Scotland, however, the early heatwave was short-lived lasting only until the 4th. Mean maximum temperatures were as much as 4.0°C above average for much of eastern England. With pressure high over the North Sea the British Isles were brought into a hot southerly airstream on the 1st and 2nd which saw daytime temperatures approach 30° C in the Stirling area (29-5°C at Parkhead and 30-0°C at Bridge of Allan) but these were low in comparison to the temperatures in excess of 35°C which were experienced south of the border (see note 3 August heatwave). A series of rain-bearing cold fronts brought about a sharp cooling which affected Scotland by the 3rd and England by the 4th. The weather became fresh with occasional showers until the 8th when high pressure began to retreat southwards making way for active frontal systems. The days up to the 12th were generally cloudy and dull with some long periods of drizzle. While the cloud cover persisted night-time temperatures remained high and from the 8th to the 12th air temperatures never fell below 12.5°C at Bridge of Allan. Weak cold fronts

moved south-eastwards across Scotland on the 13th and 14th which freshened the air but a deepening depression moved rapidly into Scotland on the 15th which was an exceptionally dull and wet day (17.3mm). In its wake the following three days were fresh, but on the 19th a series of complex frontal systems saw a return to dull and damp weather. A ridge of high pressure extended from the south-west from the 20th but brought generally dull weather with low cloud and occasional drizzle, although there were some clearances, notably on the 24th which was sunny and warm (23.3°C). Night-time temperature remained very high particularly on the 27th/28th when it fell to only 15.0°C. Pressure began to fall on the 27th as rain-bearing cyclonic systems moved in from the north-west giving a more unsettled look to the last few days of the month.

September. Generally unsettled but remarkably dry.

Although a ridge of high pressure extended eastwards across southern England on the 1st and 2nd rain fell over Scotland from a weak warm front. The weather remained unsettled with occasional brighter spells until the 6th when pressure began to increase from the west. The 5th was a dismally wet day following a superb lunar halo the previous evening. The 6th and 7th were clear and fresh as the wind veered north-westerly but by the 8th an anticyclone had become firmly established over the British Isles where it remained until the 16th. Days were bright and sunny, often after a misty dawn, and maximum temperatures exceeded 20°C from the 10th to 12th. A cold front imported cloud and rain in a freshening wind on the 16th. A deep depression moved from south-east of Iceland on the 18th bringing rain in a very strong westerly wind which caused many problems for road, rail and sea travellers throughout Scotland. As it became slow-moving off Norway the wind veered to the north-west. Temperatures fell very sharply in the arctic air (11.9°C on the 20th) and the first substantial hill snow was noted on the 21st. While pressure remained high over the Atlantic Scotland stayed in this cool air but visibility was remarkably good. Night temperatures fell perilously close to freezing on the 26th (0.9°C at Bridge of Allan). The Atlantic anticyclone moved rapidly south-eastwards across Britain between the 25th and 27th and the weather became cloudy and dull for the remainder of the month.

October. Warm and wet.

The first six days were very unsettled with a series of very active frontal systems crossing Scotland. On three of these six days, the 2nd, 5th and 6th, 24-hr rainfall totals exceeded 23mm and during the 6th serious floods were widespread in central Scotland. The Allan overtopped its banks for the first time since February. Pressure rose briefly on the 7th and 8th but unsettled windy weather returned late on the 8th. The weather was very changeable for much of the remainder of the month with the occasional

sunnier and warmer day. An active depression to the west of Britain brought in very mild southerly air on the 13th and 14th which were remarkably warm in some parts (greater than 17°C in the Stirling area). As pressure began to build over the north Atlantic on the 29th temperatures fell in cold arctic air and by the 31st the snowline had lowered to only 150m OD. Although nights were cold the month remained frost-free.

November. Mild and generally dry

Low pressure over Scandinavia and high pressure over the Atlantic to the west brought the British Isles into a strong arctic airstream over the first four days. Visibility was very good and days were sunny and fresh. Night-time temperature hovered close to freezing. As high pressure moved slowly eastwards to lie over northern Scotland by the 5th the wind dropped and the first night frost of the winter occurred under clear skies (-1.6°C at Bridge of Allan). Cloud, however, began to increase and the 6th and 7th were rather gloomy but frost-free. The anticyclone yielded to low pressure systems from the west late on the 8th and the weather became exceptionally dull and wet. On the 10th it was effectively dark by 2.30 in the afternoon. Dull wet and really rather miserable weather persisted seemingly without end until the 18th when the sky cleared in the wake of a cold front which brought in fresher polar air. Temperatures began to fall and night frosts returned on the 20th. A ridge of high pressure on the 22nd brought the first substantial frosts (-3.2°C at Bridge of Allan) and the day-time temperature rose to only 5.5°C at the same station. A shallow low moved southwards across Britain on the 23rd and 24th which resulted in very little by way of rain but restored the protective cloud cover to bring a temporary end to night frost. As the low became slow moving over northern France Scotland experienced a raw easterly wind in which rain fell on the 25th. High pressure returned on the 26th and the remainder of the month was calm with night frosts.

December. Cold at first becoming windy and wet

Pressure remained high over most of the British Isles for the first five days but the sky was usually cloudy which reduced the risk of frost. Temperatures remained above average in the anticyclonic gloom. A series of southwards moving troughs brought in low cloud and rain in a freshening wind on the 6th. A deepening low over eastern England developed on the 7th bringing more rain which began to turn to snow. The wind became strong north-easterly on the 8th and many parts of England and Wales experienced blizzard conditions while central Scotland remained clear but very cold. Late on the 8th an occluded front brought milder conditions northwards which pushed the snowline from 60m up to 300m within a very short period. With a strong ridge of high pressure extending from the northern Baltic into the mid-Atlantic to the north of the British Isles,

Scotland experienced a run of cold easterly winds until the llth when a deep depression with more cloud and rain tracked southwards down the North Sea. Pressure rose very quickly on the 12th and 13th and under clear skies night-time temperature fell to give a sharp frost early on the 13th. Daytime temperature struggled to only 2.5°C at Bridge of Allan later the same day. A weak warm front had moved into Scotland by the 14th bringing low cloud and very poor visibility. The weather remained very dull but frost-free for four days and fog persisted all day on the 16th. Pressure began to fall on the 18th which heralded the start of an extremely unsettled, wild and wet, last two weeks of 1990. A series of deep depressions to the north of Scotland trailed their rain-bearing fronts across Britain in a seemingly endless queue. Temperatures, however, reached an unseasonal 12.5°C at Bridge of Allan on the 21st. Heavy rain fell in a south-westerly gale on the 22nd (22.3mm) which resulted in some local flooding. Similar conditions returned on Christmas Day which brought flooding to parts of England and Wales. The rain turned to snow by the evening of the 27th and lay for a while locally (0.5cm). On higher ground snow and strong winds caused travel chaos over much of Scotland. The 28th was again wet and windy and snow returned on the 29th. As a cold front crossed Scotland later in the day heavy continuous snow was accompanied by thunder. By early the next morning this had accumulated to a depth of 2cms. Snow was still lying in patches as the New Year arrived.

DATA SOURCES

1 Stirling (Parkhead)

Grid reference: NS 815 969 - University gardens. Elev. 35m. Aspect: South-east Shelter Index: 33.2 (slightly sheltered) Established: 1970. Monthly returns of daily (0900-0900 GMT) observations are submitted to the Met Office. During 1990 there were a considerable number of incorrect or missing readings. Maximum temperatures appeared to be too high from September onwards and there were some obvious carry-overs of observations. Maxima were missing for December. Where possible, missing or incorrect observations have been estimated by cross-reference to nearby Bridge of Allan. Weekly observations of ground-level rainfall and run-of-wind were discontinued.

2 Ochil Hills (Carim)

Grid reference: NN 864 049-upper catchment of the Burn of Ogilvie near to the ruined Carim Lodge. Surrounded by open moorland. Elev. 332m. Aspect: north-west. Shelter index: 16.6 (exposed). Established: 1980. An autographic recording station serviced on Mondays. For much of the year data were of very poor quality and should be used with caution. Weekly rainfalls were missing on 15 occasions (29%) and more than 74 days (20%) of temperature data were also missing. Where possible, missing and incorrect values have been estimated by cross-reference to Parkhead or Bridge of

Allan. Hygrographs performed intermittently and few reliable values of relative humidity were obtained. The Automatic Weather Station was not fully operational for most of the year.

3 Bridge of Allan (Westerlea)

Grid reference: NS 795 964. Location: a rural back-garden station: Local shelter from trees and houses otherwise open aspect across the Forth valley. Elev. 10m. Aspect: south-east Shelter Index: 46.5 (sheltered) Established: 1984. Non-standard equipment and exposure. A Six type maximum and minimum thermometer at 1.8m above ground on the north-facing side of a wooden post. Calibrated regularly. Home-made plastic raingauge under test. Stevenson's screen available but yet to be installed. Maximum temperatures are occasionally elevated by reflection of solar radiation from house nearby. Monthly returns are sent to the Climatological Observers' Link.

NOTES 1

Global Warming

1990 saw the publication of the much awaited report *The Scientific Assessment of Climate Change* compiled by the Intergovernmental Panel on Climate Change and published jointly by the World Meteorological Organisation and the United Nations Environment Programme. Reaction has been mixed, from those who applaud the presentation of some form of definitive statement on the issue, to those who would lay greater emphasis on the substantial scientific uncertainties involved. What is certain is that there still remain more questions than answers and, despite the apparently clear circumstantial evidence provided by a warmest-ever 1990, the processes involved in global climatic change are far from adequately understood. Both the Royal Meteorological Society and the American Meteorological Society have issued formal statements (referenced below), the latter perhaps adopting the more critical approach. The following important points are raised in the American statement:

"The evidence is insufficient to state conclusively that human-induced global warming has occurred."

"The number and distribution of observations over the last century are insufficient to decipher the exact nature and character of temperature changes that have taken place"

"The length of the record and the confidence in the observations are insufficient to conclude positively that the apparent warming over the last century has exceeded what might be expected from natural variability in the climate".

"Inadequate computation resources and insufficient knowledge of the processes which govern (climate) systems interactions are the primary impediments to improved predictive (climate) system models" There are serious weaknesses in our current understanding of the many important

atmospheric processes"

However, we can not ignore the fact that the amount of the major 'greenhouse gases' in the atmosphere is increasing and it is highly probable that they will have very marked effects on global climate; the problem lies in determining what these effects will be and how long it will take for them to become fully apparent.

American Meteorological Society, 1991. Policy statement on global climate change. *Bulletin American Meteorological Society* 72(1) 57-59.

Harrison, S. J. 1991. Global Warming: Predicting the Uncertain. Report SUCS/03/91. Stirling University (available £2.00).

Royal Meteorological Society, 1991. The greenhouse effect: a draft statement. *Weather* 46(1) 26-29.

2 January 25th storm

A deep depression moved very quickly eastwards across the British Isles between the 24th and 26th. During the 25th its centre, with a lowest pressure of 951mb, lay off the north-east coast of England. The winds to the south of this centre were very strong south-westerly and gusts of between 70 and 90 knots (35-45 m/s) were recorded over much of southern England. Mean wind speeds over the same area, particularly near coasts and on exposed higher ground, exceeded 50 knots (25 m/s). The storm was slightly less violent than the famous October 1987 storm but nevertheless caused the death of at least 45 people in England and Wales. That this was double the death toll of the 1987 storm could be attributed to the fact that the strongest winds on January 25th occurred during the daytime when more people were out and about. On the other hand, fewer trees were brought down (roughly 3 million), which was due in part to the lack of foliage at this time of year, thus lowering wind resistance. Vehicles were blown over, roofs removed from property, and many homes were without electricity.

Climatological Observers Link Bulletin for January 1990, contains useful speed and damage data on the storm.

McCallum, E. 1990. The Burns' Day Storm, 25 January 1990. *Weather* 45(5) 166-173. Rowe, M. 1990. The storm of 25th January 1990. *J Meteorology* (UK) 15 197-200.

3 August heatwave

High pressure lay over the North Sea and Scandinavia between the 1st and 3rd of August which brought dry and very stable tropical continental (cT) air to the British Isles. Long hours of sunshine heated the ground surface which was very dry so surface heat loss through evaporation was relatively small. Most of the available heat was thus available to raise the temperature of the lower atmosphere. The previous record high temperature of 36.7° C using standard thermometer exposure was exceeded on the 3rd when Cheltenham reached 37.1°C. A cold front moving south-eastwards across Britain between the 3rd and 5th gradually reduced daytime

temperatures back down to the seasonal average. Brugge, R. 1990. The heatwave of 1-4 August 1990. COL *Bulletin* August 1990 Brugge. R. 1991. The record breaking heatwave of 1-4 August 1990 over England and Wales. *Weather* 46(1) 2-10

Perry, A. H. 1990. The extremely hot spell of early August 1990 in Britain. *Journal of Meteorology (UK)* 15 (154) 383-384.

4 Snowstorms of December

A depression and associated complex frontal systems developed to the south of Cumbria early on the 7th in a strong arctic maritime airstream. This deepened as it moved slowly south- eastwards and brought heavy snow in very strong winds for most of the day on the 8th. In northern Britain winds were strong north-easterly and there was a considerable accumulation of snow, particularly on higher ground above 200m OD, although falls were generally small in Scotland. Drifts of 2m or more were reported in the northern Pennines blocking many main roads. The English Midlands from Cheshire southwards into Oxfordshire experienced the worst of the snow. Blizzard conditions reduced visibility to less than 200m at times and snow accumulated very rapidly (as high as 4cm/hr) during the morning of the 8th. Drifts of 1m or more made travel difficult and by midday a 50km stretch of the M6 had been brought to a virtual standstill. It was 48 hours before some vehicles were freed.

Climatological *Observers Link Bulletin* for December 1990 contains many useful eye-witness reports particularly from observers in the Midlands.

Pike, W. S. 1991. The heavy early-season snowfalls of 7-9 December 1990. *Journal of Meteorology (UK)* 16 (158) 109-121.

5 Workshops for schools

(a) The department of Environmental Science continues to offer in-service workshops for teachers of Geography. These focus on the design and execution of projects in physical geography and cover weather, stream, biogeographical (inc. soils) and landscape studies. Information on the next workshops, which are provisionally scheduled for early in 1992, is available from the author. The notes from the workshops have now been published.

Harrison, *S.*]., Grieve, I. C., and Haynes, V. M. 1990. Investigations in physical geography. Some practical guidelines *Scottish Association of Geography Teachers Journal* 19 71-83.

(b) During May 1990 the Department also organised a workshop on 'Weather Data Supply to Schools' on behalf of the Royal Meteorological Society and the Met Office. This was attended by representatives from the Scottish regional councils. A report has been prepared summarising the discussion and the main recommendations.

Harrison, S. J. (Editor) 1990. Weather Data Supply to Schools. .Report *SUCS/03/90* (Stirling University Climate Services).

c) The Royal Meteorological Society is organising a series of intensive

one-day workshops for teachers which will cover many aspects of weather study. These are to take place in Edinburgh (Sept 21st), Paisley (Sept 28th) and Aberdeen (October 5th). Full details are available from Dr C N Duncan, Education Secretary, Royal Meteorological Society, 104 Oxford Road, Reading RG1 7LJ.

6 Weather for road engineers

A short one-day training course on basic meteorology, in relation to low temperature and fog hazards is available.

Harrison, S. J. 1990. A short course in basic meteorology for road engineers. *Report CHU/02/90.* Stirling University, Environmental Sciences Department.

7 University weather services

During 1990 the work of the former Climatic Hazards Unit was separated into two services:

WEATHERWISE a professional consultancy service working in full collaboration with the Met Office. The service offers assessments of weather sensitivity of a wide range of commercial enterprises and customised weather forecasting services from the Met Office. Further details from Professor Keith Smith in the Department of Environmental Science.

Climatological services to the community, including schools, are now offered through Stirling University Climate Services (SUCS). Further details are available from the author.

The University now has a satellite station which is currently receiving pictures from the geostationary satellite Meteosat. An Automatic Weather Station has been installed on the roof of the Cottrell Building which will be monitoring solar radiation, wind speed and direction, and air temperature. The work of all services is outlined in report Harrison, S.J. and K. Smith. 1991. Climatic Hazards Unit Report 1989-90. Transfer to new consultancy services. *Report SUCS/05/91.* Stirling University.

8 Effect of elevation

The Ochil Hills (Carim Lodge) station has now been in operation for more than 10 years. It has continued to generate much needed data on air temperature and rainfall in the hills, in addition to providing a focus for undergraduate and postgraduate student projects. Unfortunately, the data for 1990 were of a poor quality so they are not discussed here. However, it is interesting to compare the data from the station with those from Stirling Parkhead over the period 1981 to 1990. The Ochil mean rates of change of maximum, minimum and mean temperatures, and rainfall are given in the following table:

	Maximum Temperature ° C/1000m	Minimum Temperature °C/ 1000m	Mean Temperature ° C/1000m	Rainfall mm/10m
J	11.1	3.0	7.1	1.68
F	13.1	4.4	8.8	1.22
M	13.1	4.4	8.8	2.39
A	12.1	5.7	8.9	0.85
M	12.5	5.1	8.8	1.13
J	12.1	5.4	8.8	0.82
J	13.1	5.7	9.4	0.64
A	12.8	4.4	8.6	1.77
S	12.1	3.0	7.6	1.56
O	12.8	1.7	7.2	1.99
N	11.8	2.7	7.2	0.82
D	10.1	1.3	5.7	2.30
YEAR	12.1	3.7	7.9	17.18
			Mean	1.43

Measured rates of temperature change with height are very steep. The usually quoted rate of change for mean temperature is 6.5°C/1000m but here is 7.9°C/1000m in the Ochil Hills. However, even this value is less than the 9.0°C/1000m derived for paired weather stations near Balquhidder (Johnson and Simpson). The overall steepness of gradients is related to both external factors (eg. frequency of polar maritime (mP) air in which free atmosphere lapse-rates are steepest) and internal factors (eg contrasts in exposure between sheltered glen and open hillside, reduced solar radiation due to increased cloudiness at hill sites, spring snow-lie on higher ground). Seasonal patterns of change in lapse-rate values are most noticeable with respect to minimum temperatures where the relatively higher frequency of very stable atmospheric conditions in autumn and early winter means that there are more temperature inversions at this time of year.

The rate of increase in rainfall is intermediate between the typically steeper rates on the west coast of Scotland (>2.0mm/10m) and the shallower rates on the east (<1.0mm/10m). The problem in hill areas is the inevitable one of making reliable measurements of precipitation in winter when much of it falls as snow, and the stronger winds reduce the collecting efficiency of the standard raingauge. Nevertheless it would appear that rates of increase with height are higher in the winter half of the year.

Johnson R.C. and T.K.M. Simpson. 1991. The automatic weather station network in the Balquidder Catchments, Scotland. *Weather* 46(2) 47-50.

9 Severn Estuary: Aerial inputs programme

This programme, which has been sponsored by the National Rivers Authority and the Department of the Environment, has been

investigating the atmospheric inputs of metals such as Al, Cd, Cr, Cu, Ni, Pb and Zn to the tidal waters of the Severn Estuary. Analysis of the Jala has shown strong concentrations of metals deposited within relatively short distances of the Avonmouth industrial complex with secondary concentrations derived from South Wales. Analysis of meteorological data has illustrated the important controls of wind direction and rainfall (wet deposition). The atmosphere would appear to be providing a little less than 10% of the total metal inputs to the estuary. Final reports are due spring 1991. Postgraduate student Jackie Vale has been responsible for carrying out the bulk of the research work as part of a her PhD studies.

Vale J. A., S. J. Harrison and C. D. Watts. 1991. Aerial Inputs to the Severn Estuary. Final Report to DoE. Report 2747-M Water Research Centre, Medmenham.

10 Publications during 1990

Harrison, S. J., Grieve, I. C., Haynes, V. M. Investigations in physical geography: some practical guidelines. *Scottish Association of Geography Teachers Journal* 19 71-83.

Harrison, S. J. A short course in basic meteorology for road engineers *Report CHU/02/90.*

Harrison, S. J. (Ed) Weather data supply to schools Report *SUCS/03/90.*

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SUCS and CHU reports are available, £2.00 each (inc. p&p), from the author, Dr Harrison, SUCS, Department of Environmental Science, University of Stirling, FK9 4LA. Cheques payable to 'The University of Stirling'. A list of reports is available on request.

	Mean Maximum 'C	Difference from Average	Highest Maximum	Lowest Maximum	Mean Minimum 'C	Difference from Average	Highest Minimum	Lowest Minimum	Mean 'C	Difference Parkhead to Carim	No. days < Q'C
January	4-7	+1-7	9-0	-0-6	1-3	+1-9	5-8	- 1-3	3-0	3-6	10
February	5-8	+2-9	9-5	1-0	1-0	+2-1	7-5	- 2-0	3-4	2-3	9
March	6-6	+1-5	11-2	1-0	2_5	+2-2	7-5	-4-1	4-5	3-2	8
April	8-2	+0-1	19-3	3-0	1_9	+0-6	6-8	- 3-6	5-0	2-4	6
May	12-6	+1-0	22-2	6-0	4-6	+0-4	8-8	0-1	8-6	3-2	0
June	13.7	-0-2	19-1	7-9	6-3	-0-6	9-9	2-9	10-0	2-3	0
July	14-8	-1-3	21-3	8-4	8.5	-0-6	12-7	3-3	11-7	3-7	0
August	14-9	-0.5	24-1	9-9	9-1	+0-2	14-8	5-6	12-0	4-1	0
September	11-4	-0-9	16-5	7-3	5-6	-1-4	10-8	0-6	8-5	3-0	0
October	9-0	-0-2	B-2	2-6	4-6	-0-1	8-7	0-3	6-8	(4-6)	0
November	4-7	-0-4	9-9	0-3	1-0	-0-7	6-3	- 3-4	3-2	(3.5)	10
December	(3-5)	-0-7	7-0	0_7	(0-1)	(+0-3)	2-9	-3-7	(1-8)	(2_7)	12
YEAR	9_2	+0-2	24-1	- 0-6	3_9	+0_3	14-8	- 4-1	6-5	3-3	55

Table 1. Monthly Temperatures (Stirling, Parkhead) 1990

	Mean Maximum °C	Difference from Average	Highest Maximum	Lowest Maximum	Mean Minimum °C	Difference from Average	Highest Minimum	Lowest Minimum	Mean °C	No. days No. of <O°C	Mean Soil Temp.oC (O.3m at 09)
January	9.4	+3·2	12·7	4·7	3·9	+3·5	8·6	-0,3	6·6	1	3·7
February	10·0	+3·4	13·0	3·3	1-4	+0·9	7·6	-5,4	5·7	9	4·2
March	11·8	+3·0	15·0	5·5	3·6	+2.0	9·0	-3'2	7·7	3	6·3
April	12·6	+0·9	22·2	8'5	3·1	-0,0	9·0	-2·6	7·4	2	8·5
May	18·2	+3·0	25·9	10·3	5·5	0·0	9·1	0·4	11·8	0	13·0
June	18·1	+0·6	23·0	15·0	(6'4)	-1,8	12·2	2·9	12·3	0	15·0
July	20·9	+ 1·1	25·4	16·6	9·9	-0,8	15·0	2·8	15·4	0	16·9
August	21·3	+2.1	29'5	17·2	11·0	+1·0	15·0	7·0	16'1	0	16·6
September	16·3	+0·3	20·4	10·2	6·8	-1-3	12·6	0·7	11·5	0	13·4
October	(15'9)	+3·0	18·3	12·2	6·8	+ 1·3	9·7	1·9	(11.4)	0	11·0
November	(10'4)	+1·4	15·5	5·0	2·9	+0·5	9·0	-2·5	(6'7)	5	6·1
December	(8'4)	+ 1·2	12·3	4·8	0·7	-0,6	6·0	-5,7	(4'5)	10	3'2
YEAR	14·4	+1·9	29'5	3·3	5·2	+0·4	15·0	-5,7	9·8	30	9·8

Table 2. Monthly Temperatures (Ochil Hils, Carim) 1990

Tab;e 3 and 4 Monthly Precipitation

	Total Precipitation	Percentage of Average	Percent of Accum. Average	Greatest tall in 24 hours		Number ot Days				Total Precipitation	Percentage of Average	Percent of Accum Average
				Amount mm	Date	Prect,. Recor ed	O·2rnm or more	1-Omm or more	5·Omm or more			
January	202.4	188.5	188.5	24.2	22nd	30	29	25	15	(219.3)	135.4	135.4
February	212·0	322·2	239·3	21·8	11th	27	27	26	17	(227.0)	218.3	168.0
March	98.2	116.1	198.8	16.5	5th	21	21	19	7	(147.3)	88.5	137.4
April	45.1	110·3	186·7	13·1	1st	12	12	10	4	(68.1)	100.4	132.4
May	35'5	59·6	165·6	9·8	7th	12	12	7	3	(56.3)	57.7	120.2
June	106·7	192·3	169·1	22·9	6th	17	17	15	6	(168.3)	206.3	130.5
July	34·3	56·5	154·7	7·6	3rd	11	11	9	3	(51.3)	63.1	123.3
August	59·3	82·8	145·3	17·3	15th	17	15	12	3	(123.7)	92.5	118.7
September	37·0	39·9	130.0	8·6	18th	16	14	9	1	(66.9)	45.0	108.2
October	161·8	166·3	134·8	29·3	2nd	20	20	18	8	(208.0)	117.1	109.5
November	51.7	51·8	124·9	11·2	25th	15	15	10	5	(74.1)	60.7	105.1
December	110·4	112·3	123·6	22·3	22nd	18	18	17	6	(141.2)	81.3	102.3
Year	1154·4	123·6	–	29·3	2/10	216	211	177	78	(1551.5)	102.3	–

3 Stirling 1990

4 Ochil Hills
(based on week;y totals)

	Mean Maximum °C	Highest Maximum	Lowest Maximum	Mean Minimum °C	Highest Minimum	Lowest Minimum	Mean °C	Precipitation mm	Greatest Fall in 24 hours	
									Amount mm	Date
January	8.5	12.8	3.5	2.4	8.0	-1.7	5.4	215.8	32.1	22nd
February	8.9	13.7	3.0	2.8	9.7	-2.3	5.8	263.1	29.2	3rd
March	11.7	15.7	6.9	4.2	9.2	-3.3	7.9	103.3	18.3	5th
April	13.3	25.0	7.2	3.3	9.1	-2.0	8.3	54.5	13.1	1st
May	18.7	27.8	11.0	6.5	10.9	1.0	12.6	59.4	23.7	7th
June	19.0	25.6	12.3	8.3	12.1	3.4	13.1	111.1	26.1	6th
July	21.2	26.6	15.7	10.2	14.2	3.0	15.7	47.1	12.2	3rd
August	20.3	30.0	15.3	10.8	15.0	5.7	15.6	70.0	23.3	15th
September	17.1	22.7	11.9	6.4	13.2	0.9	11.8	35.9	7.3	18th
October	13.7	18.0	5.5	6.9	11.4	1.9	10.3	163.4	28.9	5th
November	9.3	13.8	4.1	2.0	8.2	-5.0	5.6	43.7	10.7	25th
December	7.0	12.5	2.1	0.3	6.7	-6.0	3.6	115.2	22.6	22nd
YEAR	14.1	30.0	2.1	5.3	15.0	-6.0	9.6	1282.5	32.1	22/1

Table 5 Temperature and precipitation data for Bridge of Allan (Westerlea Drive) 1990

	Maximum Temperature °C	Minimum Temperature °C	Soil Temperature (0.3m at 09.(0) °C	Total Precipitation mm	Maximum Temperature	Minimum Temperature	Total Precipitation mm
January	6.2	0.4	2.9	107.4	3.0	-0.6	162.0
February	6.6	0.5	2.7	65.8	2.9	-1.1	103.7
March	8.8	1.6	4.4	84.6	5.1	0.3	166.4
April	11.7	3.1	7.6	40.9	8.1	1.3	67.8
May	15.2	5.5	11.5	59.6	11.6	4.2	97.5
June	17.5	8.2	14.7	55.5	13.9	6.9	81.6
July	19.8	10.7	16.6	60.7	16.1	9.1	81.3
August	19.2	10.0	16.3	71.6	15.4	8.9	133.8
September	16.0	8.1	13.7	92.7	12.3	7.0	148.8
October	12.9	5.5	10.2	97.3	9.2	4.7	177.6
November	9.0	2.4	6.2	99.9	5.8	1.7	122.0
December	7.2	1.3	3.8	98.3	4.2	0.4	173.6
YEAR	12.5	4.8	9.2	934.3	9.0	3.6	1516.1

Table 6 Weather frequencies for Bridge of Allan (Westerlea Drive) 1990

Tables 7 and 8 Climatalogical Averages

	NUMBER OF DAYS								
	Air Frost	Precipitation				Snow Lying at 0900	Snow Fall 09-09	Fog at 0900	Thunder Heard 09-09
		Recorded	0.2rnrn or more	1.0mm or more	5.0rnrn or more				
January	5	29	29	25	15	2	5	1	0
February	6	26	26	25	20	5	7	0	0
March	4	21	21	17	8	2	4	0	0
April	6	13	13	11	4	0	5	3	1
May	0	13	10	10	2	0	0	0	1
June	0	20	19	13	8	0	0	0	2
July	0	11	11	10	3	0	0	1	0
August	0	19	17	12	4	0	0	1	0
September	0	16	13	8	2	0	0	1	0
October	0	22	22	17	8	0	0	2	0
November	9	16	15	9	3	0	0	1	0
December	11	20	20	17	8	4	4	1	1
YEAR	41	226	216	174	85	13	25	11	5

7 Stirling, Parkhead 1971-90

8 Ochil Hills, Carim 1981-90

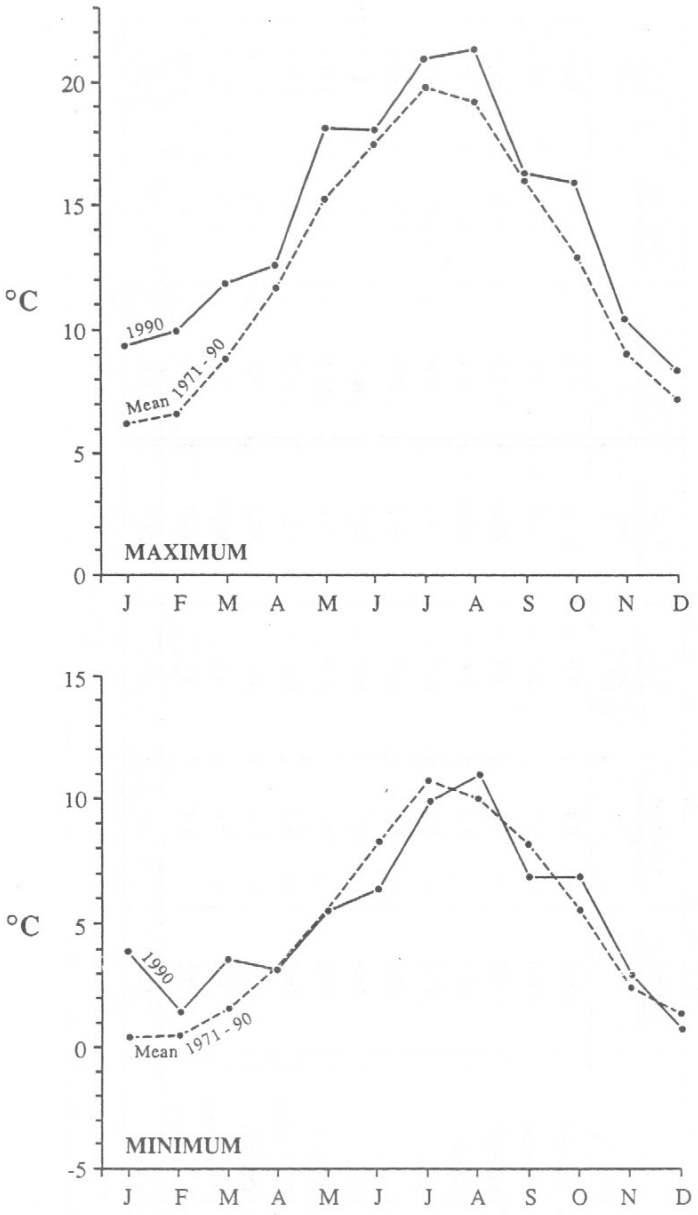
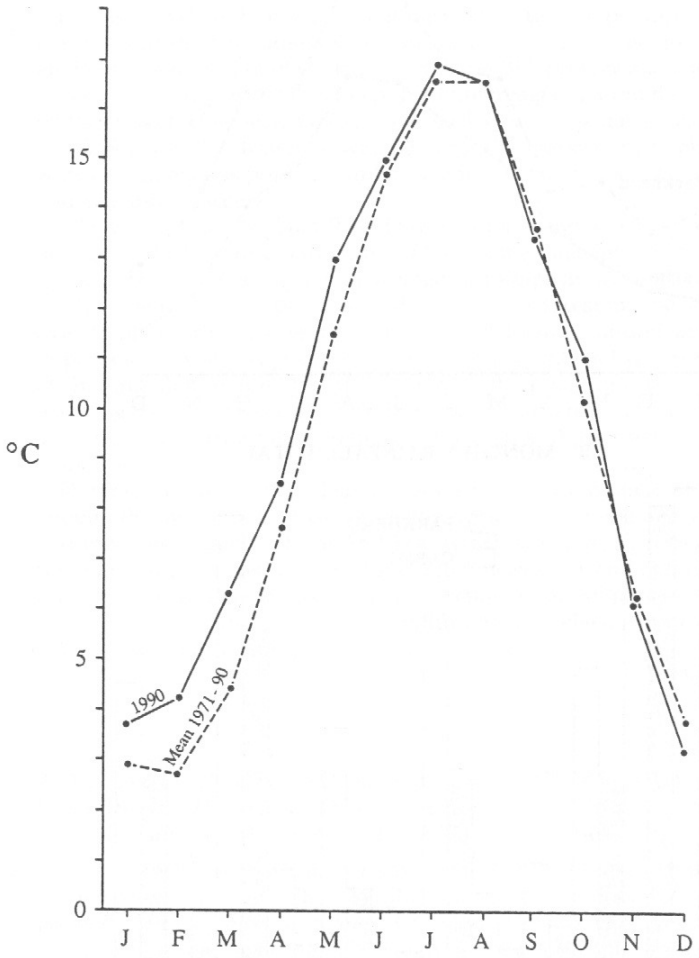


Figure 1 Air temperatures at Stirling, (Parkhead) 1990 and mean 1971-1990

Figure 2 Earth temperatures (30cm) at Stirling (Parkhead) 1990 and mean 1971-90



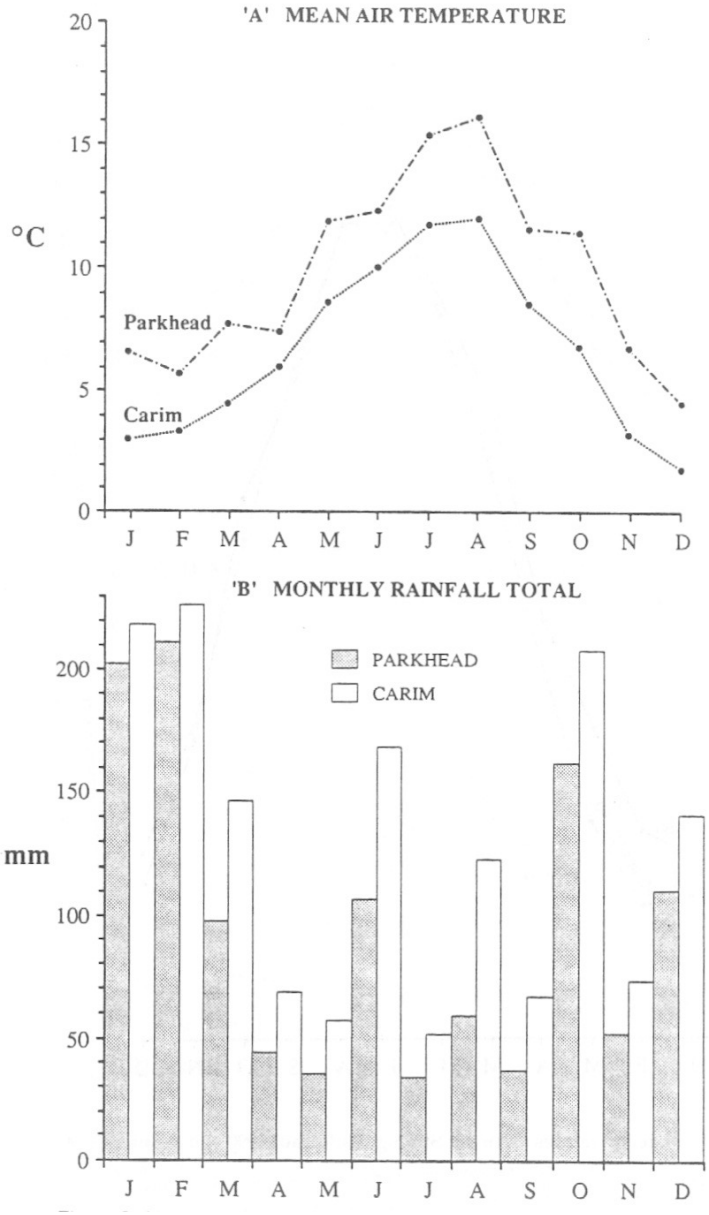


Figure 3 Air temperature and rainfall comparisons between Stirling (Parkhead) and Ochil Hills (Carim) 1990

BOOK REVIEWS

GLOBAL WARMING. Article by Peter Downing based on talk to tosh Chapter, Landscape Institute, January 1991. *Landscape Scotland Quarterly 7, 2.* Spring 1991. ISSN 0266 0954. £1.50. pp. 11-17.

Few would deny that a potential increase in the temperature of the Earth s surface and atmosphere, or global warming, is the major **environmental** concern of the latter part of the 20th century and it is good . see groups such as the Landscape Institute trying to inform themselves the subject. However, as with many such environmental issues there is a tine line to be drawn between getting the message through to as wide an audience as possible, and misleading through oversimplication and scientific inaccuracy. While we should applaud Peter Downing for trying to convey a sense I urgency in his presentation, he unfortunately falls into the traps of **trying** to be all-embracing in his coverage and simplistic in his discussion the scientific concepts involved. In his brief resume he grossly oversimplifies the nature of climatic mechanisms, understates the importance of water vapour, and is wholly inaccurate in his description the greenhouse effect. While the list of potential impacts of global warming contains most of mankind's principal concerns, Peter Downing does have this irritating tendency to throw trivial information at his audience.

The trap of environmentalism always lurks around corners and sure enough this discussion considers photochemical smog, the ozone hole and the water balance of the Aral Sea, which are at best peripheral to the central topic. Looking at the list of references at the end of the paper is not surprising that this is not a particularly helpful paper and it is a pity that the Landscape Institute couldn't have received a more critical scientific account of the problems of global warming.

S. J. Harrison

A VILLAGE OF CROSSROADS & CHARACTERS: DUNNING, PERTHSHIRE IN OLD PHOTOGRAPHS. Lorne A. Wallace Communications, 1991. 80pp. ISBN 0 9518501 0 5. £4.95.

This Scottish-Canadian author has in a short time of research put together a striking collection, not just of buildings, but pointedly with humour and anecdote, of people— a 1901 group of 19 on the back cover including one "real name not known, horseman and notorious drinker"!!! A real "local Studies gem of a book.

L.C.

BOOK REVIEWS

A SCOTTISH NATURE DIARY. Douglas Willis. John Donald, Edinburgh. 1990. 175pp. Hbk. ISBN 0 85976 305 6. £13.95.

The author takes us on a wide ranging tour of Scotland throughout the year touching on many different subjects of natural history and providing a selection of personal reminiscences. Certainly there is plenty of interest to everyone, although I expect the armchair nature lover will learn most from this book, there is nothing too scientific in it. Just occasionally the narrative tends to be rather disjointed, perhaps like the weekly nature diary that Douglas Willis has contributed to the *Ross-shire Journal* for a number of years. Hopefully, though, this need not detract from enjoyment of the book. It is liberally interspersed with poetry from some well-known and lesser so writers to set the scene for the changing seasons. Of the 65 colour photographs, reproduced to a high quality, some are excellent, especially the red deer stag, but surely the author (or the publisher) could have found a better picture of a golden eagle? Writing a book about the countryside in a diary format is now a tried and tested method. Many writers have successfully done this in the past and no doubt others will continue to do so. This recent offering by Douglas Willis is the latest in a long line of country diaries. It is easy reading and the type of book that you can dip into at any time. At £13.95 it is well priced and although it may not appeal to everyone, I am sure that it will be a good seller.

Mike Trubridge

THE SCOTTISH ENVIRONMENT No. 2 1989. Scottish Development Department, Scottish Office 1990. ISBN 0 7480 0309 6. 87pp. £5.

This is the second in a series of annual statistical digests covering a wide range of environmental information from demographic data through to detailed analyses of pollution. There is little offered by way of comment so the 87 pages are packed with tables and multi-coloured maps. The production quality is high. In the seven sections (1) covers basic demographic information; (2) the land — includes changes in landuse — agricultural and forestry, mineral production, housing, roads and waste disposal; (3) the atmosphere — includes climatological data for 12 sites in Scotland plus a range of air quality data including metals, ozone, SO2, NOx; (4) water — resources and consumption, quality data and oil spill incidents; (5) conservation — statutory protection, selected species distributions, fish conservation and building preservation; (6) radioactivity — basic data on levels, and discharges to atmosphere and water, and waste disposal; (7) recreation — tourism data including occupancy.

This is an excellent source of information well worth £5: from The Librarian, Room 1/44, Scottish Office, New St Andrews House, Edinburgh EH1 3TG.

S.J. Harrison

FORTH AREA BIRD REPORT 1990

C. J. Henty

University of Stirling

Readers will see that this year's report has changed its name back to an older version. Due to revisions in the boundaries of the Local Recorder system of the Scottish Ornithologist's Club, the simple title of Central Region has become misleading and in need of modification. The area covered by the report comprises the Districts of Falkirk and Clackmannan together with Stirling District excluding Loch Lomondside and other parts of the Clyde drainage basin. Records from Carron Valley may be published both here and in the report on Clyde birds.

The summer of 1990 was not particularly dry and sunny, unlike further south, and no widespread changes in breeding birds were noted. Kingfishers continue to be widely reported and there are at last signs of a resurgence of Stonechats whilst there are indications that Twite may have colonised new parts of the Ochils; the record of successful breeding of Gadwall is also notable. However, Ring Ousels appear to be decidedly scarce, even in suitable habitat, and there were no reports of Corn Buntings from their toehold around Grangemouth. I have included some details of numbers of common birds recorded per tetrad (4 sq km) during the ongoing BTO survey of breeding birds. The wintering flock of Bean Geese is still present although less visible since Carron Valley Reservoir seems to have been deserted, Barnacle Geese were seen in good numbers but Greylags continue to be much less common that Pinkfeet. Buzzards were strikingly apparent in the Trossachs in early spring but the Red Kites released in the RSPB scheme seem to have kept just outside our boundaries - at least, no definite records have come to me.

On the estuary there have been record numbers of Black-tailed Godwits and a strong passage of Curlew Sandpipers in September. An influx of Guillemots started in late October whilst away from the coast there have been irruptive movements of Waxwings and Crossbills.

A cheering event for preservation of wildlife on the estuary was that the dumping of rubbish on the lagoon at Kinneil has been halted by a conservation order, however, active interest in this locality will be needed to safeguard it on a longterm basis.

The SOC is encouraging the appointment of deputy Local Recorders and I am pleased to report that the Stirling Branch has appointed Bill Brackenridge for our area, his experience has already proved valuable in assessing records and how they should be presented.

This report is compiled from records submitted by : A.Barr, M. V.Bell, Birdline Scotland, W.R.Brackenridge, R.A.Broad, D.M.Bryant,

D.L.Clugston, J.Crook, M.Darling, A.Dennis, C.Eames, J.Engleby, B.Hay, C.J.Henty, N.Hughes, C.Jameson, R.Jones, R.McNab, J.Mitchell, S.F & A.V.Newton (S&AN), R.Noble-Nesbitt (RNN), G.Owens, C.A.Rankin, H.Robb, R.Shand, S.T.Spencer, A.Stevenston, P.Stirling-Aird (S-A), B.R.Thomson, D.Thorogood, M.Trubridge, M.Ware, J.Wheeler - given by initials in brackets.

SYSTEMATIC LIST

Codes - F and C indicate records from Falkirk and Clackmannan Districts, S and SWP those from the onetime Stirlingshire and southwest Perthshire parts of Stirling District.

RED-THROATED DIVER *Gavia stellata*

Loch A: Pair on 31 March. Loch E: Pair attempted to breed - first clutch of 1 egg broken, second clutch (1 egg) disappeared. Loch G: Pair displaying 3 May, one on 24th (MT). Another pair nested but failed in north of area (WRB)

F 1 Grangemouth 16 December (MVB)

BLACK-THROATED DIVER *Gavia arctica*

Loch A: 3 on 20 April, regular to 20 May, then 2 on 27 June and 13 July. No breeding attempted , probably due to falling water level in May. Loch F: Pair on 1 June apparently with nest; no birds or nest on 3 July, many Common Gull chicks present (RAB MT)

LITTLE GREBE *Tachybaptus ruficollis*

C 1 Cambus pool 25 March (WRB). Wintering on R Devon: 1 Alva 25 February to 3 March, 1 on 30 November and 2 on 1 December; 2 Harviestoun 13 November - 21 December (S&AN)

S Airthrey. 1 in January and February, 5 on 12 March. 5 pairs fledged 10 young, late season with first young on 25 June. Max 18 on 29 September, last 1 on 21 November (MVB)

SWP 1 on Teith at Lecropt, 23 December (JC). Pair bred Cromlix (WRB)

GREAT CRESTED GREBE *Podiceps cristatus*

F Kinneil: 30 on 29 July, 113 on 6 August and 235 on 18th, 375 on 9 September, 400 on 14 October, 250 on 4 November (DMB, JC CJH DT). 5 off Blackness 27 January (CJH)

C 3 (2 adult, 1 juvenile) on Forth at Cambus 2 August (CJH). 3 Gartmorn Dam 14 January, 8 on 4 November, 4 on 31 December (some display) (MVB CJH)

S 1 Carron Valley Resvr 17 Feb (WRB), pair at east end 25 April (CJH). 1 North Third Resvr 31 March (S&AN). 1 L Coulter 25 April (CJH)

SWP 2 Lake of Menteith 25 March (DT), 3 pairs with young (2,1, and

1) on 14 August; none seen L Watston (RAB WRB).
1 L Venachar 22 April (CJH)

MANX SHEARWATER *Puffinus* puffin us
F 1 Kinneil 9 September (DMB)

GANNET *Sula bassana*
F 4 Kinneil 4 September (DMB)

CORMORANT *Phalacrocorax carbo*
477 on Forth Estuary 17 December (DMB)
F Skinflats: 104 on 12 January, 41 on 9 February, 140 on 21 September, 256 on 4 November, 202 on 16 December (MVB)
C 6 Gartmorn Dam 9 February, 2 on 4 November (MVB)
S 5 Airthrey 18 January, 2 on 12 March, 1 until 3 May (MVB). 1 North Third Resvr 25 April (CJH) SWP 26 Lake of Menteith 11 March, 12 on 28 April (RAB). 2 L Lubnaig 25 August and 23 October (1 juv) (BH CJH)

GREY HERON *Ardea cinerea*
F 14 Skinflats 4 November, 19 on 16 December (MVB)
S 6 North Third Resvr 13 October (CAR)

MUTE SWAN *Cygnus olor*
C Pair with 3 young Cambus pool (WRB JC CJH). 19 Gartmorn Dam 21 September (MVB)
S Pair at Airthrey fledged 5 out of 7, group there to 18 December (MVB) SWP Pair bred Mailing, Lake of Menteith (RAB JE). Pair with 4 young Cromlix (WRB). 3 (1 juv) L Venachar 28 January (CJH)

WHOOPER SWAN *Cygnus Cygnus*
C 1 (4 juv) Gartmorn Dam 31 December (CJH)
S 15 NW L Coulter 31 March (S&AN). 3 (1 juvenile) L Laggan 24 November (DT)
SWP Blackdub: 46 adults on 21 January to 23 March, last 17 on 28 March, (RAB WRB DT MT). 40 Dripend on 11 February and 11 March, 16 on 28th (MVB CJH). 10 Gargunnock (Birkenwood) 25 February and 6 on 24 March (DT). 9 Wester Frew 11 February (MVB). 91 Carse of Stirling 25 March (S&AN). 3 Lake of Menteith and 4 L Venachar 28 January (CJH). 16 L Chon 31 March and 3 on 3 April. 3 L Katrine on 1 April (MT), 20 L Dochart 4 March (DT), 5 NW Crianlarich 8 April (MT). Thornhill: 6 (4 imm) on 6 January and 9 (3 imm) on 10 February; 5 adults on 27 October, 17 on 13 November and 24 on 16th (RAB DT). 12 Lecropt 3 November (DT). 12 L Watston on 9 December (MVB). Blairdrummond: max 31 on 1 to 16 December (RAB DT)

BEAN GOOSE Anser *fabalis*

C L Ellrig: 89 on 11 January, 109 on 13th; 112 on 10 February (DLC AS)

PINK-FOOTED GOOSE Anser *brachyrhynchus*

F 1735 Skinflats 21 October (DMB). 120 Airth 9 December (DT)

C 1 Cambus Pool in full wing moult 27 July to 30 August (WRB JC CJH), 2 on 21 September (S&AN). Parties of Grey geese flying W at Menstrie - 120 on 26 March, 100 on 30 April (BRT)

S Bridge of Allan: heard flying N at 21.25 on 22 April, 23 N at 12.50 on 23rd, 35 NW at 16.20 on 1 May; heard at night over Stirling 2 May (CJH DT). 100 NW Airthrey 11 May (H Riley) SWP 5196 on Carse of Stirling 27 January (S&AN). 1300 Blairdrummond on 6 January and 800 on 25 February, 1000 Blackdub 21 January (DT). 404 Aberfoyle and 980 Kippen 18 January, 2524 Kippen on 16 February and 750 on 29 March; 2450 Gargunnock 16 February (RAB DT). 3400 Lecropt 16 February (WRB). Several thousand at Lake of Menteith end of April (J Engleby). 2 L Katrine most of summer (MT). 3100 Lake of Menteith 13 October and 1000 Thornhill on 14th. 2000 Lecropt 3 November and 1300 on 22nd, 1000 Arnprior on 18th (RAB WRB DT). 3342 on Carse of Stirling on 21 October and 3016 on 15 November (RAB). Roost at L Mahaick late October - mid November, max 4500; 640 in late December (S&AN)

WHITE-FRONTED GOOSE Anser *albifrons*

SWP 2 (Greenland race) with Pinkfeet on Carse of Stirling - Ballinton on 27 January and Lecropt 11 February (MVB S&AN)

GREYLAG GOOSE Anser anser

C 95 Gartmorn Dam 4 November (MVB). 43 L Ellrig 13 January (AS)

SWP 250 L Ruskie 27 January (DT). 23 Aberfoyle 10 February. 550 Gargunnock and 146 Kippen 16 February. 612 Carse of Stirling 27 January, 410 on 13 November (RAB S&AN)

BARNACLE GOOSE Branfa *leucopsis*

F 1 Kinneil 31 January; 3 Skinflats 14 October (DMB)

C 1 Cambus 21 September (S&AN). 1 (with Pinkfooted Geese) Clackmannan 4 November (MVB)

SWP total 7 Carse of Stirling 27 January (S&AN). 2 Thornhill 21 January (DT). 1 Aberfoyle 10 February, 4 Lecropt (with Pinkfeet) 16 February (RAB WRB). 8 Lake of Menteith 13 October, 41 Thornhill on 21st (with Pinkfeet, heard later going toward Lake of Menteith). 9 Carse of Stirling 13 November (RAB)

BRENT GOOSE Branfa *bernida*

SWP 1 with Pinkfeet and Greylags Thornhill 13 November (RAB)

SHELDUCK *Tadorna tadoma*

3100 (moult flock) Forth estuary 21 September (DMB)

F 3482 rangemouth 18 August (DMB), 1600 Kinneil 9 December (DT). Skinflats: 657 on 12 January, 324 on 9 February; 1057 on 4 November (MVB). 200 Carriden shore 23 December (CJH)

C 10 Cambus 25 March, 2 pairs Cambus pool (WRB). 40, mainly juvs, Tullibody Inch 2 August (CJH)

WIGEON Anas *Penelope*

778 on Forth Estuary 17 December (DMB)

F 13 Skinflats 4 November (MVB)

C Gartmorn Dam: 490 on 9 February, 40 on 24 March; 54 on 21 September, 400 on 4 November (MVB BRT). 4 Cambus Pool 30 August (CJH). 150 Alva (Greenhead floods) 25 February - 3 March, 40 on 7 October (S&AN)

S 1 Airthrey 12 July (MVB)

SWP 4 Lake of Menteith 13 January; L Macanrie: 20 on 13 January, 14 on 16 October and 28 on 18 November (RAB)

GADWALL Anas *strepera*

F 1 Skinflats 5 September (GO)

C Pair Cambus Pool 25 March to 1 May (WRB). Female with 6 young 26 May (S&AN)

TEAL Anas *crecca*

1980 Forth Estuary 12 January (DMB)

F Max at Skinflats 22 on 12 January and 111 on 16 December (MVB). Kinneil: 800 on 28 January, 1450 on 14 October, 400 on 4 November and 250 on 9 December (DMB DT)

C 315 Gartmorn Dam 9 February, 63 on 21 September and 120 on 4 November (MVB). 474 Bandeath 13 January and 160 on 11 November (DMB CJH). 31 Cambus 25 March (WRB), 3 Cambus Pool 27 July and 8 on 30 August (CJH). 5 Alva 25 February - 3 March (S&AN), 5 Menstrie 30 December (BRT)

SWP 160 L Macanrie 10 February (RAB). 3 Pairs L Katrine (W) 21 April and 6 (2 females) Achray-Venachar marshes on 22nd (CJH). Pair Glendevon (Wastrig Burn) 9 April (S&AN)

MALLARD Anas *platyrhynchos*

1270 Forth Estuary 4 November (DMB)

F Max at Skinflats 462 on 12 January and 339 on 4 November (MVB)

C 735 Gartmorn Dam 9 February, 467 on 21 September and 310 on 4 November (MVB). 75 Alva (Greenhead floods) 25 February - 3 March, 17 pairs 6 April; 75 on 7 October. 60 on Devon (Fossaway) 18 September (S&AN)

S Airthrey: max 383 on 14 February, 609 on 13 August then 250-378 to end of year. 28 broods and 79 fledged (MVB). 140 North Third Resvr 17 December (WRB)

PINTAIL *Anas* acute

76 on Forth Estuary 9 February (DMB)

F Skinflats: 68 on 12 January, 85 on 7 February and 68 on 9th, 3 on 18 September, 24 on 4 November and 35 on 16 December (RAB MVB GO). 4 Kinneil 29 July (DT), 6 on 7 October (RS)

C Pair Cambus Pool 25 March to early April (WRB). 1 Alva 7 September (S&AN), 1 (female) Gartmorn Dam 21 September (MVB)

GARGANEY Anas *querquedula*

F Male Skinflats 18 May and 5 June (GO MW)

SHOVELER *Spatula clypeata*

F 4 Kinneil 14 October (DMB)

C 1 (imm male) Gartmorn 9 February (MVB). Male Cambus pool 25 March and 1 May (WRB). Alva (Greenhead floods) 25 February - 3 March and Alva Pools 28 March with a pair on 29th (S&AN). 3 Cambus 22 October (CJH)

POCHARD *Aythya farina*

C 18 Gartmorn Dam 9 February, only 8 on 21 September and 4 November (MVB). 15 on Forth at Cambus 22 October (CJH)

S max 4 Airthrey 18 January (MVB), 1 male on 30 June (CJH). 22 Carron Valley Resvr 27 November (S&AN)

SWP 10 L Lubnaig 19 December (WRB)

TUFTED DUCK *Aythya fuligula*

C 95 Gartmorn Dam 9 February, 181 on 21 September and 117 on 4 November (MVB). 2 Pairs Alva (Greenhead floods) 25 February - 3 March (S&AN)

S max at Airthrey 64 on 19 January and 21 November; poor breeding season, only 17 fledged from 8 broods (MVB). Female Upper Earlsburn Reservr 14 June (CJH). 29 North Third Resvr 7 December (WRB)

SWP pair with 4 juv Cromlix in early July (WRB)

SCAUP *Aythya marila*

F 2 Kinneil 31 January (DMB)

LONG-TAILED DUCK *Clangula hyemalis*

F 1 Grangemouth Docks 21 October (DMB), 1 Skinflats 6 November (GO)

GOLDENEYE *Bucephala clangula*

124 Forth Estuary 9 February (DMB)

F 13 (10 males) Blackness 27 January (CJH). 11 Skinflats 9 February (MVB)

C 40 Gartmorn Dam 9 February and 31 on 4 November (MVB). Max 10 Alva (Greenhead floods) 25 February - 3 March (S&AN).

12 on Forth at Cambus 27 November, 20 Blackgrange 16 December (CJH)

S 1 (male) Airthrey 16 October (MVB)

SWP 6 (1 male) L Venachar 22 April, none in July. Pair + 2 females L Katrine 21 April (CJH)

RED-BREASTED MERGANSER *Mergus senator*

102 Forth Estuary 17 December (DMB)

F 51 Skinflats 12 January, max in autumn 17 on 16 December (MVB)

S Female Airthrey on 10 and 11 May (MVB)

GOOSANDER *Mergus merganser*

F 6 Skinflats "4 November (MVB)

C On Devon: 13 NE above Dollar 18.20 on 30 September (? roost movement), max 7 Harviestoun 13 November - 13 December, 4 Balquharn on 23rd (S&AN)

SWP 10 Lake of Menteith 14 January (RAB). 4 pairs L Katrine 21 April, 2 females Achray-Venachar marshes on 22nd (CJH). Up to 3 Dunblane March and November-December, 11 Castlehill Resvr 26 November (BH SN)

HONEY BUZZARD Perm's *apivorus*

SWP 1 Trossachs 1 August (WRB). This bird appeared more slender and long-tailed than common Buzzards seen just before. It circled overhead with wings held in a flat plane, tips not upturned; a pale plumaged bird so that the distinctive underwing barring and the clear-cut and spaced bars on the underside of the tail were plainly visible (sketch provided)

HEN HARRIER *Circus cyaneus*

S male Earlshill 19 August (CJH)

SWP 1 Lake of Menteith 29 March and 13 October (RAB DT). Male Strath a'Ghlinne 17 June (CJH). 1 Ashfield 8 August, 1 wingtagged bird (from Rannoch) Callander 11 November (WRB)

GOSHAWK

SWP Female on 10 October (S&AN)

SPARROWHAWK *Accipiter nisus*

S At Bridge of Allan males mobbed by Goldfinches on 3 April and Swallows on 10 May, pair mobbed by Pied Wagtails and a Crow on 14 October (JC). 1 with prey Bandeath 27 November (CJH)

BUZZARD *Buteo buteo*

C Pair soaring Sheardale 2 March (CJH)

S 1 West Plean 22 October (WRB). 1 Touch 3 February (CJH). 1 Dumyat 23 March, 1 Sunnylaw 18 August, 1 Airthrey 5 October, 1 Lecropt on 23rd (MVB CJH). Gargunnock 25 March: 5 in 4 localities. 1 Ballochleam 14 June (CJH)

SWP Callander 28 March, 19 in 4 localities. West Trossachs 29 March, 1 soaring in 23 localities. 2 L Venachar 22 April, 1 on 3 July. 1 Allt Ruidh (NN6508) 22 June. 3 Sheriffmuir 17 August. 1 L Lubnaig 21 October (CJH)

GOLDEN EAGLE *Aquila chrysaetos*

SWP At a Trossachs site where the male was shot in 1988 a new male appeared and one young was fledged; first succesful breeding here for many years (RAB MT)

OSPREY *Pandion haliaetus*

S 1 Carron Valley Reservoir 21 June and 3 October (A Fairweather WRB)

SWP 1 Crianlarich 26 September (RAB). 1 L Drunkie 3 November (G.J.Brock)

MERLIN *Falco columbarius*

Probably 3 pairs in north of region,two bred successfully rearing 3+ and 1 young (RAB)

C 1 Alva 30 November (S&AN)

S 1 Airthrey 30 March (DMB)

SWP Female Upper Glendevon Resvr 16 May (S&AN)

PEREGRINE *Falco peregrinus*

SWP and C: Of 20 territories checked 3 were unoccupied, 10 successful pairs raised 22 young (per PS-A)

F 1 Kinneil 9 December (DT)

SWP 1 N of Callander, stooping at Ravens on 16 October (S&AN)

PTARMIGAN *Lagopus mutus*

SWP January: 1 Stobinian NN4322 on 6th, 1 on 22nd Ben Tulaichean NN4119, 2 on 28th Ben Each NN6015. March: 2 Ben Challum NN3831 on 4th, 3 Sron nan Eun (Lochay) NN2035 and 7 Ben Heasgarnich NN4137 on 17th (RAB)

BLACK GROUSE *Tetrao tetrix*

SWP 4 Glen Ample NN6019 2 January, Males Balquhidder NN4417 and NN4316 on 1 May (RAB)

CAPERCAILLIE *Tetrao urogallus*

SWP Male lekking Drumore Wood 6 April, 1 nearby 1 August (WRB)

GREY PARTRIDGE *Perdix perdix*

C Pair with 3 juv Menstrie 10 July and 9 on stubble 30 December (BRT). Pair on Ochils above Dollar at 400m on 20 May, nest with cl4 by Devon at Alva on 27 May (S&AN). 16 Clackmannan Kerse 18 November and 6 +13 on 24 December, 7 Cambus on 27th; 6 Blackgrange 16 December (CJH S&AN)

S 12 Cowie 21 November (WRB). Regular at Plean, max 11 on 8 October (CAR)

QUAIL *Coturnix coturnix*

WP calling Thornhill 24 July (WRB)

MOORHEN *Gallinula chloropus*

S At Airthrey 17 pairs fledged 49 young (very good season), max count of 57 on 18 December (MVB)

COOT *Fulica atra*

C Gartmorn Dam: 63 on 9 February, 71 on 21 September but 370 on 11 November. 4 pairs Cambus Pool, 3 bred successfully (WRB)

S At Airthrey 25 pairs fledged 19 young (very poor season, toxic algae suspected - compare Tufted Duck); max 72 in late winter, 64 in autumn (MVB) SWP 240 Lake of Menteith 13 January (RAB)

OYSTERCATCHER *Haematopus ostralegus*

1124 on Forth Estuary 21 September (DMB)

F max 4 Skinflats 9 February, 21 on 4 November (MVB). 70 Blackness 23 December (CJH)

C 35 Cambus Pool 3 March (WRB); 3 Menstrie 10 March (BRT); 10 Alva (Greenhead floods) 25 February - 7 March, 7 pairs on 31st (S&AN)

S Heard over Stirling and Bridge of Allan on 18 February, 2 Airthrey on 21st; 120 Craigforth 25 February (MVB JC DT). Pair nested on roof of University fledging 2 young on 3 August (MVB) SWP 1 Lake of Menteith 10 February, 1 Ashfield on 12th (RAB WRB).

360 Blairdrummond 11 March, only 48 on 24th (MVB DT). 78 Carse of Stirling 25 March 8 (S&AN)

RINGED PLOVER *Charadrius hiaticula*

F max Skinflats 11 on 4 November (MVB). 51 Kinneil 17 August (DMB)

C Heard Upper Glendevon Resvr 16 May (S&AN)

GOLDEN PLOVER *Pluvialis apricaria*

3045 Forth Estuary 4 November (DMB)

F 500 Airth 7 February (RAB), 160 18 November (CJH) and 120 on 9 December. 70 Kinneil 9 December (DT). 50 Blackness 23 December (CJH). Skinflats: 25 on 12 January and 30 on 9 February; 70 on 4 and 6 August, 150 on 21 September, 390 on 4 November, 380 on 16 December (MVB CJH)

C 18 Sheardale 2 March (CJH)

S 300 Bandeath 23 January, 50 Gargunnock 16 February and 6 on 14 October (RAB DMB DT)

SWP 55 Lecropt 16 February. 3 pairs Meall na Samhna 1 July (WRB)

GREY PLOVER *Pluvialis squatamla*

F Skinflats: 23 on 21 September, 17 on 21 October, 16 on

4 November, 8 on 16 December (DMB MVB CJH). 13 Grangemouth 21 September (MVB). 70 Kinneil 14 October (DMB)

LAPWING *Vanellus vanellus*

780 on Forth Estuary 4 November (DMB)

F 130 Kinneil 28 January and 500 on 4 November (DT). Max Skinflats 760 on 12 January and 790 on 16 December (MVB). 600 Kincardine Bridge 18 November (CJH). 1470 Bandeath on 13 January (DMB)

C 1400 Tullibody Inch 2 August, flocks flying in from west (CJH)

270 Alva 25 February - 3 March; first broods 9 May; 200 on 10 August. 450 Bannockburn 23 August, 330 on plough at Gogar 21 September (S&AN) 2 pairs Cambus Pool, one bred (WRB)

SWP 300 Blairdrummond 10 February (flood water), 400 Lecropt 27 January and 750 on 16 February (RAB WRB). 2 pairs displaying Thornhill 25 February (DT)

KNOT *Calidris canutus*

4400 Forth Estuary 12 January (DMB)

F 4500 Kinneil lagoon 7 February (RAB), 26 on 29 July (mainly red adults) and 500 on 9 December (DT). 2000 Skinflats 12 January, 250 on 9 February; 1550 on 16 December (MVB). 15 Blackness 23 December (CJH)

LITTLE STINT *Calidris minuta*

F 1 Kinneil 29 July (DT). 1 Skinflats 4 September (GO)

CURLEW SANDPIPER *Calidris ferruginea*

F Kinneil: 1 on 13 August, 9 on 1 September and 42 on 9th, 11 on 11th, 4 on 15th and 22nd, 6 on 23rd (DMB GO RS). 1 Grangemouth on 21st September (MVB) . Skinflats: 2 on 24 August, 19 on 4 September, 22 on 5th, 42 on 6th, 12 on 7th, 1 on 18th (AD GO)

DUNLIN *Calidris alpina*

2873 Forth Estuary 17 December (DMB)

F 1350 Skinflats 12 January, 350 on 21 September to 1830 on 16 December (MVB). 800 Kincardine Bridge 18 November, 300 Blackness 23 December (CJH)

RUFF *Philomachus pugnax*

F Kinneil: 3 on 11 August, 2 on 12th, 4 on 14th and 17th, 3 on 18th, 16 on 25th, 6 on 26th. 4 on 1 September, 6 on 9th, 5 on 10th, 4 on llth, 3 on 15th (DMB RNN RS). Skinflats: 4 on 10 August, 1 on 14th, 1 on 23rd, 2 on 24th, 4 on 25th and 26th (GO RS)

C 10 Tullibody Inch 13 August (CJH). 4 Cambus Pool 21 August (WRB)

JACK SNIPE *Lymnocryptes minimus*

F Kinneil: 4 on 20 January, 3 on 18 March, 1 on 7 October, 7 on 9 and 13 November; 9 on 1, 23 and 25 December, 7 on 30th (MD RS GO)

C Devon at Alva: 1 on 30 March and 16 October, 4 on 16 December (S&AN) SWP 1 Doune Ponds early March (WRB). 1 Sheriffmuir 21 October, at puddle on path (MVB)

SNIPE *Gallinago gallinago*

C 10 Devonmouth 2 August and 2 on 30th (CJH). Devon at Alva: 8 on 27 February - 3 March, 16 on 22 October and max 9 on 2 November - 16 December (S&AN)

S 42 Bridge of Allan, 10 March (WRB). 2 on 28 April (JC). 1 Carleatheran (Gargunnock hills) 14 June (CJH). 2 North Third 13 October (CAR)

SWP Display at Achray-Venachar Marshes 22 April (CJH)

WOODCOCK *Scolopax rusticola*

S 3 North Third 13 October (CAR). 1 in rhododendron scrub Logic 19 December (S&AN)

SWP 3 roding Dunblane 24 February (MVB). 1 Duchray Water (Corriegrennan) 16 November (S&AN)

BLACK-TAILED GODWIT *Limosa limosa*

F Kinneil: 11 on 28 January, 4 April and 12 May, 13 on 20 April,29 on 2 May. 8 on 17 July, 38 on 28th and 43 on 29th; 17 on 6 August, 31 on 10th, 43 on 12th and 45 on 17th, 21 on 19th and 23rd, 23 on 25th and 18 on 26th; 50 on 1 September, 25 on 10th, 35 on 15th, 24 on 22nd and 29 on 23rd. 25 on 4 November and on 9th, 3 on 9 December and 2 on 30th (DMB MD JC CJH GO RS DT). 2 Grangemouth 9 February, 1 on 21 September and 43 on 4 November (MVB). Skinflats: 16 on 12 May, 28 on 28th and 30 on 30th; 28 on 5 and 9 June, 11 on llth and 27 on 12th; 49 on 11 July; 3 on 23 August, 2 on 24th, 5 on 25th, 8 on 26th; 1 on 4 September, 9 on 5th and 4 on 7th (DMB AD GO RS MW)

C 1 Tullibody Inch 13 August (CJH)

BAR-TAILED GODWIT Limosa *lapponica*

493 Forth Estuary 4 November (DMB)

F 200 Kinneil 28 January (DT). Only 1 Skinflats, on 12 January (MVB) 15 Blackness 23 December (CJH)

C 1 Tullibody Inch 13 August (CJH)

WHIMBREL *Numenius phaeopus*

F Skinflats: 2 on 28 July, 4 on 23 August, 1 on 21 and 30 November (GO RS). Kinneil: 1 on 28 July, 2 on 12 and 13 August (RS)

C 1 over Alva 4 September (S&AN)

S 1 over L Coulter 31 March (S&AN)

CURLEW *Numenius arquata*

1172 Forth Estuary 4 November (DMB)

F 210 Skinflats 12 January, 144 on 9 February, 123 on 4 November (MVB
150 in flooded fields Champany (Carriden) 23 December (CJH

C Return Alva 2 March (S&AN). 16 Blackgrange 16 December (CJH)

S 1 N over Bridge of Allan 11 March (JC). Tetrad counts: Ballochleam NS6490 8 on 14 June; NS6690 4; NS6890 0. SWP 120 Blairdrummond 11 March. 10 W L Katrine 21 April (CJH). Passage SW, Strathallan, from 26 June (MVB). Tetrad counts: Strath a Ghlinne NN6618 0 on 17 June; Bracklinn 6408 5 on 22 June, Brackland NN6608 14 on 22 June (CJH)

SPOTTED REDSHANK *Tringa erythmpus*

F Kinneil: 1 on 28 and 31 January, 12 March, 1 on 20 September, 4 November; 2 on 14 October (DMB RS DT). 1 Grangemouth 21 September (MVB). 3 Skinflats 2 September and 2 on 4th (RMN GO)

REDSHANK *Tringa tetanus*

2590 Forth Estuary 4 November (DMB)

F 805 Skinflats 12 January, 665 on 9 February, 300 on 21 September and 610 on 4 November (MVB). 750 Kinneil 28 January (DT). 60 Blackness 23 December (CJH)

C Return Alva 18 March, 3 on 24th; 4 pairs on 31 March and 5 on 6 April (BRT S&AN). 70 Alloa Inch 18 November (CJH) Pair with juv Cambus Pool in June (WRB)

GREENSHANK *Tringa nebularia*

F Kinneil: 1 on 28 July and on 11 and 18 August, 3 on 17 August; 1 on 15, 22 and 23 September (DMB GO RS). 1 Grangemouth 9 February (MVB). Skinflats: 1 on 28 July, 3 on 10 August, 4 on 14th, 6 on 23rd, 8 on 25th, 5 on 26th; 3 on 4 September, 5 on 5th and 6th, 6 on 18th; 6 on 7 October, 1 on 4 November (AD CJH RMN GO RS)

C 2 Tullibody Inch 13 August (CJH), 1 Cambus on 21st (WRB)

GREEN SANDPIPER *Tringa ochropus*

F Kinneil: 1 on 10, 13 and 18 August, 3 on 14th (GO RS)

C 1 Devonmouth 30 August (JC CJH)

SWP 1 Allanmouth 31 July (JC CJH)

WOOD SANDPIPER *Tringa glareola*

C 1 Cambus Pool 10 and 17 May (WRB NH)

COMMON SANDPIPER *Actitis hypoleucos*

F 9 Kinneil 29 July (DT)

C 1 Muckhart 23 April (DMB), 1 Alva on 22nd; 2 pairs on 5 May (S&AN)

S 1 Bridge of Allan 21 April (JC), 1 Airthrey on 25th (MVB) 1 Upper Earlsburn resr 14 June (CJH) SWP 1 Killin 19 April (RAB), 4 on Leny at Kilmahog on 23rd (RJ).
6 on Ghlinne in tetrad NN 6618 17 June (CJH)

TURNSTONE *Arenaria interpres*
82 on Forth Estuary 21 September (DMB)
F 2 Kinneil 29 July (DT). 10 Blackness 23 December (CJH). 3 Skinflats 16 December (MVB)

ARCTIC SKUA *Stercorarius parasiticus*
F 1 Skinflats 21 October (DMB)

LITTLE GULL *Lams minutus*
F 1 adult Skinflats 25 August (GO)

BLACK-HEADED GULL *Lams ridibundus*
S 500 feeding in pasture Manorneuk 21 January, 1 in full breeding plumage (CJH)
C 1400 over Forth at Longcarse 11 November; high tide, flying to maintain position in NW6 wind; 60 adult: 4 immature (CJH)
SWP 300 + pairs Ashfield but only 60 fledged due to nest losses (WRB)

COMMON GULL *Lams canus*
C 60 Upper Glendevon Resvr 16 May (S&AN)

LESSER BLACK-BACKED GULL *Lams fuscus*
SWP 1 Lecropt 23 December (JC) - head pure white and upperwing and mantle black, probably northern race L.f.fuscus

HERRING GULL *Lams argentatus*
S 1100 Fallin 31 January, on rubbish dump, mainly adults (CJH)

GREAT BLACK-BACKED GULL *Lams marinus*
C 40 Cambus 31 January. 150 Tullibody Inch 2 August, adults and immatures equally frequent, 130 on 13th; 2 juv Cambus on 30th feeding on dead Salmon (CJH)

KITTIWAKE *Rissa tridactyla*
F 100 W Kinneil 12 March (DMB). 1 Skinflats on 28 July and 2 August (GO RS)

SANDWICH TERN *Sterna sandvicensis*
C 25 Tullibody Inch 2 August repeatedly flew high to W, calling loudly, then returned (CJH), 18 behaving similarly on 21st (WRB)

GUILLEMOT *Una aalge*
F 9 Skinflats 12 January, 400 on 4 November, 87 on 16 December (DMB MVB). 1 on Forth at Airth 7 February and 1 at Kinneil (RAB). 4 Kinneil 4 November (DT). 1 on road at Fallin 7 October (RAB)
75 on Forth at Cambus 22 October, parties drifted up on tide then flew back; not oiled but no diving, some calling. 3 on Forth at

Longcarse 18 November (CJH)
S 3 on Forth at Cambuskenneth 23 October, 1 dead Plean on 25th (CJH CAR)
SWP 2 Lake of Menteith 20 October (RAB), 2 R Allan 24th and 25th (JC)

FERAL ROCK DOVE *Columba livia*
F 70 Skinflats 1 September, on stubble (CJH)

STOCK DOVE *Columba oenas*
C 3 Alva 17 March, pair prospecting tree hole 4 and 6 April. 2 Dollar quarry 16 July and 3 on 17 November (S&AN)
S *1*Watton House (Gargunnock) 20 March. 3 Mount Farm (Fintry) 20 April. 1 (song) Carron Glen 20 June (CJH) SWP Pair (song) Bridge of Allan 24 April and 4 May, 4 nearby 2 June (JC). 14 Lecropt 16 February (WRB)

WOODPIGEON *Columba palumba*
S 70 Blairlogie 10 March (BRT). 300 Plean 8 October (CAR)

CUCKOO *Cuculus canorus*
C 1 Alva 8 May (S&AN)
S 1 Killearn 1 May (RAB)

BARN OWL *Tyto alba*
S 1 dead on road, Gargunnock, 6 November (M Still)
SWP 1 Sheriffmuir Inn 13 April (WRB). Pair bred at Aberfoyle in derelict building, 4 fledged 9 September and 5th 2 weeks later (MT)

TAWNY OWL *Strix aluco*
C calling Menstrie 10 May (BRT)
S calling Balwhidderock wood through year (DT)

LONG-EARED OWL *Asio otus*
C 1 Cambus Pool 11 August, hunting at 19.00, mobbed by Swallows (CJH)
SWP 1 Dunblane 15 February, in garden after snowfall (MVB) S

SHORT-EARED OWL *Asio flammeus*
F 1 Kinneil 28 January (DT), 1 on 25 December and 3 on 30th (RS MD). 4 Grangemouth 9 February, 1 on 4 November and 16 December, 4 on 17 December (MVB S&AN). 3 Skinflats 4 October (GO)
C 1 Cambus Pool 25 March (WRB)
S 1 Spout Ballochleam 14 June (CJH). 1 North Third reservoir 26 April and *2* June (RJ)

SWIFT *Apus apus*

C 1 Alva 8 May (S&AN)

S Stirling 4 May (WRB). 2 Bridge of Allan 2 May, often 60-70 in July with max 165 on 31st, last 24 August; on 22 July one was found grounded with twine (probably from nest) wrapped around primaries of one wing, ends of feathers had to be cut away and bird flew off lopsidely (DMB CJH)

SWP 2 Dunblane 5 May (BH), 3 on 6th and last 4 on 12 August (MVB). Last Ashfield 28 August (WRB)

KINGFISHER *Akedo atthis*

F 1 on Avon NS968758 5 August (JW

C On Devon: 2 Muckhart 25 April (DMB), otherwise singles— Alva 2 January and 5 May, regularly Tillicoultry-Dollar 26 September - 21 December, Crook of Devon 20 March, Auchlinsky 25 October (S&AN)

S 1 Bridge of Allan 29 January **(CJ),** Regular on R Allan April to October, 2 on 2 April and 29 May (JC). 1 Airthrey 11 September, 16 October, 21 and 22 November (MVB S&AN)

SWP 2 on Teith at Lecropt 1 August (CJH). Pair on Allan below Ashfield, seen on Teith at Lanrick (WRB)

GREEN WOODPECKER *Picas viridis*

C Reported above Menstrie, Tillicoultry, Dollar (BRT). Fledged young Dollar quarry 16 July (S&AN)

S Reported Plean, Carron Valley Forest (27 November, in conifers), North Third, Blairlogie (WRB CJH S&AN CAR) SWP Reported Doune Ponds, Pass of Leny, Drumore Wood (WRB)

GREAT SPOTTED WOODPECKER *Dendrocopus major*

C Bred Dollar Glen, brief drumming heard 19 December (S&AN)

SKYLARK *Alauda arvensis*

C 10 on stubble Gogar 30 December (BRT)

SWP 330 SW Dunblane 15 February after overnight snow (MVB). 300 Lecropt 16 February (WRB)

SANDMARTIN *Riparia riparia*

C 4 Gartmorn Dam 24 March (BRT), many on 25th (BH); 6 Gartmorn 21 September (MVB)

S 6 Airthrey on 19 March (MVB DMB S&AN). 4 entering holes by Allan at Bridge of Allan but breeding not proved (JC) SWP 8 Lake of Menteith 25 March (DT). 670 occupied holes at Barbush 15-18 July (DMB). Colony in Strath a Ghlinne (large in 1970's) now quite deserted (CJH)

SWALLOW *Hirundo rustica*

C Last Menstrie 2 on 6 October (BRT). 50 mobbing a flying

S 2 Airthrey 17 April (MVB), 1 Killin on 19th (RB). Last at Bridge of Allan: 2 on 26 October and 2 on 8 November (JC) 10 WSW Airthrey 10 October (DMB)
SWP 1 L.Katrine 27 November (J Barrington)

HOUSE MARTIN *Delichon urbica*
C 3 prospecting eaves Menstrie 29 April, 5 nests on north side; 30 on 27 July, last 2 on 6 October (BRT)
S Visiting nests at Killearn 30 April (RAB). 2 Airthrey 5 October (DMB) Last dates: 5 Stirling 28 September, 4 Bridge of Allan 3 October (JC)
SWP 3 Dunblane 4 May (BH), but not at another site till 19th (MVB)

TREE PIPIT *Anthus trivialis*
C 2 on open slopes at 300-350 m Craig Leith 12 May (S&AN)
S Singing Carron valley 25 April (CJH)
SWP Singing Venachar marshes 22 April (CJH). Reported from Drumore wood, Falls of Bracklynn, Carron Glen (WRB CJH)

MEADOW PIPIT *Anthus pratensis*
F 40 Grangemouth 4 November (MVB)
S Tetrad counts: 21 NS6490, 42 NS6690, 119 NS6890 on 14 June (CJH)
SWP Tetrad counts: 54 NN6618 on 17 June, 16 NN6408 and 66 NN6890 on 22 June (CJH)

GREY WAGTAIL *Motacilla cinerea*
S Regular Airthrey from 21 May to late September (MVB). 1 at Plean on 31 October was foraging on roof of a cottage (CAR). Reported in breeding season from Menstrie, Carron Glen, Venachar marshes, Dunblane (from 1 March), Strath a Ghlinne, (WRB BH CJH BRT)

PIED WAGTAIL *Motacilla alba*
S 190 at roost at Airthrey 16 February (MVB). Unusually dark bird at Bridge of Allan 31 July, black bib very extensive and second wingbar scarcely visible (JC)

WAXWING *Bombydlla garrulax*
C 6 Dollar 11 November (L&F McGregor)
F 10 Falkirk 3 November, 20 on 4th, 24 on 10th (AD RS STS)
S 6 Stirling 19 November, 40 on 27th, 27 on 28th and 52 on 30th; 6 on 1 December and 2 on 13th. 1 Bridge of Allan 8 December (WRB AB JC DT) SWP 6 Kilmahog 6 November (S McNaught), 3 Dunblane 3 December (BH)

REDSTART *Phoenicurus phoenicurus*
SWP At Trossachs colony 54 clutches fledged 203 young, in spite Longeared Owl at Cambus 11 August (CJH)
of a number of total failures (HR). Reported in breeding season Fintry, Doune Ponds, Lees Hill (NS 6591), Bracklynn Falls, Strath a

Ghlinne, (WRB BH CJH)

S/F/C Passage: 1 Airthrey 12 July, Bridge of Allan on 30th and 31st; male California on 2 August, Dollar 2 September (MVB JC CJH JW)

WHINCHAT *Saxicola rubetra*

F 9 Skinflats 2 August (GO)

STONECHAT *Saxicola torquata*

C Pair Alva (Balquharn) 3 March, not seen later. 1 Alva Pools 4 September (S&AN) SWP Pair + juv Glen Ample col, heather bracken, 3 September (CJH)
2 Callander (Keltie Water) 16 October (S&AN)

WHEATEAR *Oenanthe oenanthe*

C 3 males in stubble Alva 18 March (S&AN)

F 1 Kinneil 18 March (RS)

S 2 Gargunnock 25 March (CJH), 2 Bridge of Allan 2 April (JC). Reported in breeding season Fintry, Ballochleam, Earlsburn, Menstrie Crags, Dumyat (frequent), Glengyle (frequent), Strath a Ghlinne (frequent), Brackland (CJH RJ BRT)

RING OUZEL *Turdus torquata*

SWP Pair Rhuveag (Balquhidder) 27 May (DT). Singing Coire Chloche 17 June, none Glengyle 21 April or Spout of Ballochleam - Lees Hill 14 June (CJH)

BLACKBIRD *Turdus merula*

S Male at Bridge of Allan 15 December, partial albino with head and throat white, dark markings on crown; on nape, mantle, sides of breast and upper and lower tail coverts the black feathers were intermixed with white; bill bright yellow. With other Blackbirds around fallen apples, chased off one female (CJH). A juvenile on 28 May had a breast pale grey with spots and a generally grey cast to plumage (JC). 44 in loose flock with Redwings by Airthrey Loch 27 December (CJH)

FIELDFARE *Turdus pilaris*

C 40 E at Alva 7 October, 125 Tillicoultry 29 October (S&AN)

F 400 Skinflats 4 November (CJH)

C 350 Cambus, + 18 S, 22 October; 800 on 4 November (CJH). 330 feeding on hawthorn berries Menstrie 19 December (BRT)

S 200 Kippen 27 January (DT). 40 high to N North Third 26 March, 80 Cringate Muir 25 April (CJH) 250 W Carron Valley 7 October (WRB); First at Plean 9 October (CAR), 9 W Airthrey on 16th (MVB), 500 Cambuskenneth on 23rd (CJH). Large influx Bridge of Allan 22nd-24th October, few on 25th (JC)

SWP 600 Thornhill and 100 *Ruskie 27* January, 100 Thornhill 8 March (DT JC). 100 Lake of Menteith 14 October, 53 SE Strathyre on 22nd and 200 SE Torrie Forest on 27th (CJH DT). 500 Lecropt 3 November (DT) and 800 Ashfield on llth (MVB) REDWING *Turdus iliacus*

S 38 Airthrey on 18 January, 75 on 15 March; 26 W on 3 October (MVB)

SWP 1 in mature conifer Glendevon (Hunthall) 9 April (S&AN). 6 Dunblane on 17 October (BH),many Bridge of Allan from 21st (JC CJH) 100 Lecropt on 9 December (MVB)

MISTLE THRUSH *Turdus visdvorus*

S 50 Airthrey 13 July and 57 on 6 August (DMB MVB); 10 Bridge of Allan 21 August (JC). At Airthrey on 15 March one sang with 10-20 repeated double whistles in the song (CJH)

GRASSHOPPER WARBLER *Locustella naevia*

C Song at two sites at Alva 2 and 8 May (S&AN)

S 1 on Allan at Bridge of Allan 26 April, singing till July (JC). 1 singing Airthrey 9 to 25 May (MVB)

SWP 2 Lecropt 2 May (WRB). 1 Venachar marshes 3 July (CJH)

SEDGE WARBLER *Acrocephalus schoenobaenus*

C 11 singing around Alva Pools 8 May, 8-11 pairs bred, first fledglings seen 22 June (S&AN). 2 Pairs Cambus Pool (WRB)

S First Bridge of Allan 28 April (JC). Singles Airthrey 3 May and 6 August (MVB) SWP 2 Dunblane 6 May (BH). 2 pairs Ashfield, none Doune Ponds (WRB).
6 Pairs Venachar Marshes 3 July (CJH)

WHITETHROAT *Sylvia communis*

S First Bridge of Allan 4 May, 4 singing and 2 juveniles being fed 1 June (JC)

SWP First Dunblane 7 May (BH) GARDEN WARBLER *Sylvia borin*

S First Bridge of Allan 4 May (DMB). 2 singing Airthrey 14 May (MVB), Bridge of Allan 28 May (JC). Singing Carron Glen (+ fledgling) 20 June, Venachar Marshes 3 July (CJH)

SWP First Dunblane 7 May (BH)

BLACKCAP *Sylvia atricapilla*

C Last, a male Harviestoun 26 September (S&AN)

F Male Fankerton 27 January to 1 March, fed frequently on peanuts (P Beattie per JW)

S Male Airthrey 3 to 15 May; male, 2 females and juveniles seen on 12 July, 1 on 6 August (MVB)

WOOD WARBLER *Phylloscopus sibilitrax*

SWP First at Drumore Wood and Leny Falls on 13 May (WRB). 2 singing Dykedale (Dunblane) 26 May (MVB). Feeding young by Teith below L Achray 3 July (CJH)

CHIFF CHAFF *Phylloscopus collybita*

F 1 Skinflats 18 March (RS), 1 Kinneil 30 December (MD)

S First singing at Bridge of Allan on 18 March (DMB). 1 Airthrey 25 April and 25 June - 23 July (MVB)

SWP 2 singing Doune Ponds 18 March (D Warnock), 1 on 1 October. 1 Ashfield 31 October (WRB)

WILLOW WARBLER *Phylloscopus trochilus*

F 1 Skinflats 1 April (GO) - very early (Ed)

C First Alva 26 April; first fledglings at Dollar 1 July (S&AN)

S 2 Airthrey 23 April, frequent Carron Valley Forest on 25th. Marked passage Airthrey 12 and 25 July, 50 by river at Bridge of Allan on 31st (MVB JC CJH) SWP 1 Dunblane 20 April (MVB), Venachar marshes on 22nd (CJH), 1 Glendevon on 23rd (DMB), widespread Lake of Menteith on 8th (RAB)

GOLDCREST *Regulus regulus*

S Frequent in conifer plantations North Third 26 March (CJH). Common in woods at Plean in autumn (CAR)

SPOTTED FLYCATCHER *Muscicapa striata*

C Last Harviestoun 17 September (S&AN)

PIED FLYCATCHER *Ficedula hypoleuca*

SWP At Trossachs colony 68 clutches fledged 275 young (HR)

LONG-TAILED TIT *Aegithalos caudatus*

C 10 in scrub Dollar Glen 3 March (BRT); 21 Gartmorn 21 September (MVB) 26 Tillicoultry 1 October (S&AN)

S 20 Plean 9 October (CAR), 20 Stirling 13 October (first in garden in 10 years DT), 5 Coney park 2 December (RJ)

SWP 15 L Lubnaig 23 October (CJH)

JAY *Garrulus glandarius*

Breeding season records from Invertrossachs, Brackland NN6890 (CJH) Autumn/winter records from Plean, Abbey Craig, Drumore. Regular July-December Dollar Quarry (WRB S&AN CAR)

MAGPIE *Pica pica*

S Very frequent Airthrey/Bridge of Allan, nest building on 15 February (JC CJH). Not common Plean (autumn) (CAR)

SWP More frequent Doune/Dunblane (WRB)

JACKDAW Corvus *monedula*

SWP Parties, with Rooks, flying high N over L Lubnaig 22 October and 23rd (1 party returned) (CJH) ROOK Corvus *frugilegus*

SWP Parties (max 50) feeding on grass moors, Braes of Doune, 22 June (CJH)

CARRION CROW *Corvus corone*

F 40 Kinneil 6 August (JC CJH)

C 2 feeding on dead salmon Cambus 30 August (CJH)

S 2 plucking hair from cattle at Bridge of Allan 2 April (JC)

RAVEN Corvus *corax*

S 1 Sheriffmuir 27 October (DMB). 2 Gargunnocks (Cringate Muir) 27 November (S&AN)

SWP 2 Ben Ledi 18 April (BH). Callander: 4 Tom Dubh 22 June (CJH), 7 Meall Odhar 16 October (S&AN). 2 Menteith Hills 14 October (DT). 1 over R Allan at Dunblane 18 April (BH)

STARLING *Sturnus vulgaris*

F Only 20 at Kincardine bridge roost on 18 November (CJH)

HOUSE SPARROW *Passer domesticus*

F 150 Skinflats (Orchardhead) 21 September (MVB)

S 200 at roost Bridge of Allan 23 July, in Virginia Creeper - arrived 18.30-18.45 whilst still very light (CJH)

TREE SPARROW Passer *montanus*

C 23 by Devon at Alva 3 March (S&AN)

S 15 Bridge of Allan 2 April, 5 on 2 June (JC)

SWP 10 Lecropt 11 March (MVB), 3 Dunblane 8 April - flock on 13th (BH). 30 Thornhill 31 January and 25 on 16 November (DT)

CHAFFINCH *Fringilla coelebs*

SWP 400 Drip Moss 9 December (MVB)

BRAMBLING *Fringilla montifringilla*

C 2 Dollar 27 October; 175 Harviestoun woods 13 November, only 6 on 3 December (S&AN)

S At Slamannan 6-10 November (STS)

GREENFINCH *Carduelis Moris*

C 40 on weeds Gogar 10 July (BRT)

SWP 50 Kinbuck 28 January (WRB)

GOLDFINCH *Carduelis carduelis*

C 11 Alva 2 January (S&AN). 12 Blackgrange 16 December (CJH)

S 30 Bridge of Allan 2 April, display flights on 28th (JC). 13 Airthrey 24 April (CJH). 20 Plean 8 October (CAR); 15 with Crossbills and Siskins Carron Valley Forest 27 November

(S&AN). Recorded in breeding season at Dunblane (BH), Stirling (RJ), 2 Carron valley Forest 25 April, 1 Ballochleam 14 June, Carron Glen 20th (CJH)

SISKIN *Carduelis spinus*

C Max Dollar 25 on 13 October and 40 on 17 November, 2 drinking from burn in town 22 September. 30 Tillicoultry 18 December (S&AN)

S Singing Airthrey 16 March, Carron Valley 25 April (CJH) Pair at garden feeders Stirling 24 February - 10 March (DT), 25 November and 2 December (RJ)

LINNET *Carduelis cannabina*

F 80 Grangemouth 4 November (MVB)

C 22 Alva 6 April (S&AN). 80 Longcarse 13 August (CJH) SWP 100 Thornhill 11 February and 150 Lecropt on 16th; 80 Drip Moss on 9 December and 120 Ashfield on 16th (WRB DMB) Breeding season records from: Menstrie, Dunblane, Ballochleam, Brackland (BH CJH BRT)

TWITE *Carduelis flavirostris*

C Alva: 2 in arable on 4 April and 2 Balquharn mouth 5 May; 4 Craig Leith 3 July (S&AN)

F 60 Kincardine Bridge 12 January, 50 Skinflats on 4 November and 40 on llth, 60 on 16 December (MVB DMB)

S 1 Lees Hill (Gargunnocks) 14 June (CJH)

SWP 400 Kinbuck 28 January (WRB), 1 Dunblane 2 March (BH). Nest (3 eggs) found 16 May Upper Glendevon Reservoir, just in Tayside (per SN)

REDPOLL *Carduelis flammea*

C 5 Dollar 3 and 17 November, with Siskins and Crossbills (S&AN)

S Singing Venachar marshes 22 April and Carron Valley on 25th (CJH) SWP 60 Dykedale (Dunblane) 3 January and 70 on 21 October (MVB)

CROSSBILL *Loxia curvirostra*

C First seen Dollar 8 on 13 October, 15 on 27th, 13 on 3 November and 23 on 29th, 30 on 5 December and 25 on 15th (S&AN)

S 5 Airthrey 25 and 28 June (MVB). 4 W Bridge of Allan 3 October (CJH), 4 WSW Airthrey on 10th (DMB). 86 Carron V Forest 27 November (S&AN) SWP 1 Lake of Menteith 13 January (RAB). Parties frequent (max 8) in Queen Elizabeth Forest 14 August (CJH). Numerous in October and November in Dykedale/ Sheriffmuir plantations, max 44 on 21 October (MVB). 35 Torrie Forest 27 October and 40 on 2 December (DT)

SNOW BUNTING *Plectrophenax nivalis*

F 1 Skinflats 6 November (GO)

SWP On 6 January 17 and 30 Stob Invercarnaig NN4419,15 Stobinian NN4315, 2 Cruach Ardrain NN4020 22 January, 2 Beinn Each NN6015 on 28th; 1 Glen Lochay NN5237 19 February, 3 Meall Ghlas NN4233 19 March, 3 Monachyle Glen NN4723 24 March (RAB)

YELLOWHAMMER *Emberiza citronella*

S 10 Plean 9 October (CAR), 12 Cowie 21 November (WRB)

REED BUNTING *Emberiza schoeniclus*

C 16 by Devon at Alva 3 March, 6 Cambus Pools 16 December (S&AN) SWP 6 pairs Venachar Marshes 3 July (CJH). 25 Callander (Keltie Resvr) 16 October (S&AN)

The following species have occurred in the area but either no notes have been received or the information is not suitable for individual mention, although kept on file: KESTREL *Fako tinnunculus,* RED GROUSE *Lagopus lagopus,* PHEASANT *Phasianus colchicus,* COMMON TERN *Sterna hirundo,* COLLARED DOVE *Strepto-pelia decaocto,* DIPPER *Cinclus cindus,* WREN *Troglodytes troglodytes,* DUNNOCK *Prunella modularis,* ROBIN *Erithacus rubecula,* SONG THRUSH *Turdus philomenos,* COAL TIT *Parus ater,* BLUE TIT *Parus caeruleus,* GREAT TIT *Parus major,* TREE-CREEPER *Certhia familiaris,* BULLFINCH *Pyrrhula pyrrhula.*

LOCAL BIRD RECORDING - How to send in your notes to the recorder

I hope to encourage more people to send in bird notes each year since almost everyone sees something of interest. 1 and the Deputy Recorder Bill Brackenridge are a part of the comprehensive national scheme organised by the Scottish Ornithologists' Club (SOC). We keep detailed local archives, which are the basis of the preceding annual report, and a summary is sent to the editor of the *Scottish Bird Report.* The sorts of useful information can be seen in this volume; date, place and number, are the usual basic details; please put dates in the form '1 April' rather than 1/4 which is easily misread.

Records of unusual species usually have to be backed up by a full description; we have suitable forms, and will be happy to give advice on any problems. To compile data quickly and reliably it is important that notes are grouped by species, not in diary form/order of date. Please put your name and the year at the top of every sheet and send in the accumulated notes for the year as soon as possible after the end of the year, indeed where many records are involved it would greatly help if the bulk of them were sent in November.

C. J. Henty, SOC Recorder, 7 Coneyhill Road, Bridge of Allan, FK9 4EL (0786) 832166

BOOK REVIEW

THREE DEGREE'S WEST: a walk through Britain's local and natural history. Stephen Sankey. John Donald. 1990. 204pp. ISBN 085976 299 8. £12.50.

Stephen Sankey formerly a Countryside Ranger is now Central Scotland Regional Officer for the Royal Society for the Protection of Birds. His four-legged friend, the collie "Meg", is his companion on this 600-mile hike across Britain. The errant and venturesome journey started at Lyme Regis on the Devonshire coast, and on a bearing Three Degree's West, he follows his route north across Britain to Bowhead in Orkney. The one man and his dog pass through old estates, Nature Reserves, quaint country villages and skirt round some industrial cities. They traverse farmland, grouse moors, hill and mountain tops, and cross the sea to Orkney. The unremitting pair encounter a succession of ancient buildings and many old indigenous characters.

The end product is this book, pleasantly written and easy reading, it is crammed with a wealth of historical information and truly captures so much of Britain's heritage. The author has an eye for detail; so much of the natural history we would walk past without a second look is delightfully highlighted. Although it does not set out to guide people along its route, after some reading one can't stop wanting to explore some stretches within its long distance. For the enthusiast the 34 chapters divide the journey up into more realistic walks; unfortunately there is little mention of distance or duration. The book is graced with the author's masterly black and white photographs that depict so many typical British scenes. Donald Gunn's wildlife drawings illustrate the diveristy of natural history the author observed along his travels, and further enhance this enjoyable book.

The final chapter is appropriately titled "Return of the Pinkfeet", the author refering to geese, but to anyone attempting this walk this might well be the inevitable end product! This book may appeal particularly to the historian, but will surely interest and greatly please the naturalist and the general rambler.

Michael Callan

EDITORIAL NOTE

Some readers may be interested in two papers of local appeal in the current *Glasgow Naturalist,* 1991 vol 22 pt 1.

I. C. Christie. *Ledum* on Flanders Moss Nature Reserve. pp41-6.

S. I. Baldwin. Spiders from Wallacebank Wood SSS1. Glenbervie (managed by SWT Central Scotland, Falkirk Group) — a sampling programme in 1986/7 to investigate spider fauna of the area. pp5-9.

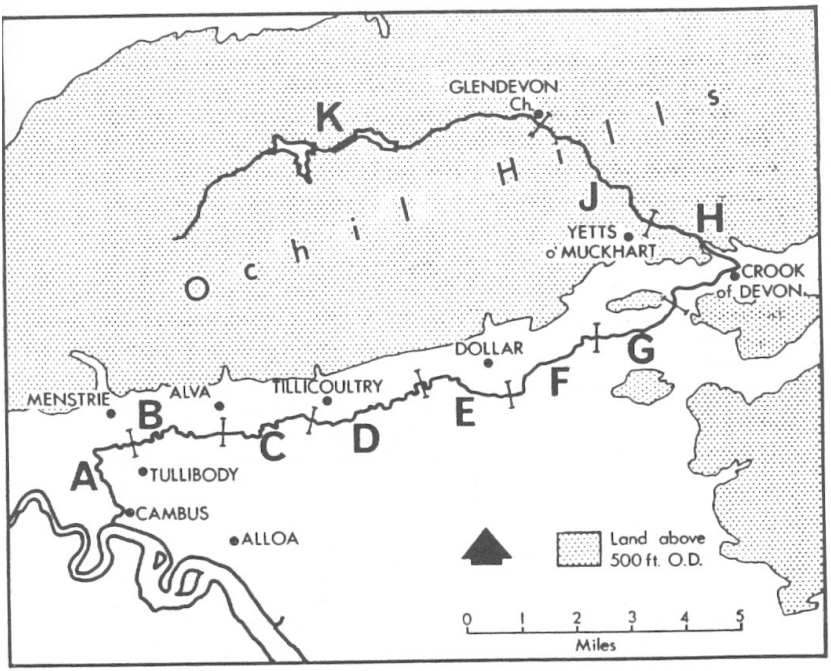


Figure 1. The River Devon, showing the ten survey sections (A-K)

BIRDS OF THE RIVER DEVON SURVEYED OVER TEN YEARS

C. J. HENTY

INTRODUCTION

The Stirling Branch of the Scottish Ornithologist's Club (SOC) organised during 1977 a survey of birds along the course of the River Devon, from mouth to source. Its aim was to ascertain the species, numbers and distribution of birds breeding or present on the River Devon or within its environs. A systematic account of breeding distribution within the Branch's area of operation had been produced by fieldwork during the British Trust for Ornithology Atlas survey of breeding distribution 1967-1972, but this information was collected on a coarse scale, by 10 kilometre square, was not correlated with local habitat types and indicated only the presence or absence of each species. The Stirling Branch felt that an organised survey of a local area could produce a more detailed picture of bird distribution and also give an indication of the relative abundance of the various species. The weekend of 28-29th May was chosen so as to be as sure as possible that all summer visitors had arrived and resident breeding species were still nesting or at least were close to the nesting areas. Maps and census forms were produced for each stretch of the river so each group could work to a common method. The results were analysed by the organising committee and a duplicated report produced (Stirling Branch SOC 1977).

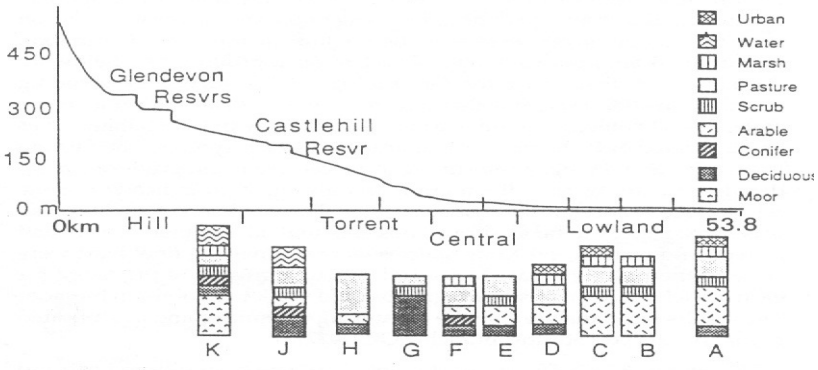
The winter of 1978-79 was a noticeably hard one (Cawthorne 1980) and it seemed sensible to collect data in 1979 to compare with 1977. This was done on the basis of partial coverage on 2nd June and some of the results were included in the area bird report for that year. On the fifth anniversary (1982) of the first survey a complete study was made on 29-30th May, analyses made of the major features of the whole set of surveys and a report presented to the Stirling Branch. Finally, on the tenth anniversary (1987) a repeat survey was organised to bring this set of studies to a suitable culmination. At first difficulties were encountered due to bad weather and lack of observers but by extending work into the following weeks (6th - 17th June) all sections of the river were covered bar one. This report aims to summarise the results of all four studies over the ten year period, especially in terms of the numbers of each species in four ecologically distinct zones of the river and also investigating any changes in abundance from year to year.

THE STUDY AREA

A profile of the river Devon and a summary of the main habitat types through which it flows are shown in figure 1. It rises about 550m above sea level in the Ochil Hills and runs eastward as a burn in a steep ravine through the Upper and Lower Glendevon Reservoirs. This 12.5 km stretch flows through rough hill grazing with some heather and is referred to as the Hill Zone.

Figure 1 River Devon: sketchmap of profile, survey sections and main habitats

Figure 1 River Devon: sketchmap of profile, survey sections and main habitats



Note: in the habitat columns the largest sized section indicates that the habitat occupies more than 50% of the survey section, middle size 10-50%, smallest size less than 10%; no symbol means that the habitat is absent or in tiny patches deemed irrelevant for breeding birds. The total height of a column is of no significance.

Next, the Devon runs as a small river, fast in the sense of Haslam (1978), first of all to the southeast through Glen Devon proper and then, after emerging from the hill mass, turning westward at Crook of Devon. This zone extends to Muckhart Mill and is made up of three of the basic observer sections. It is called the Torrent Zone since in its 14.6 Km there are many small rapids and several major waterfalls; parts of the zone are heavily wooded and a small reservoir (Castlehill) was in the last stages of construction during the 1977 survey. This new reservoir has probably not had much effect on the birds of the Torrent Zone since it is steep sided and has not added any marshy areas; moreover the loss of river and wooded habitat is of little significance in comparison with the rest of the zone.

The rest of the course of the river runs through the flat lower Devon valley. The 8.1 km section past Dollar to Tillicoultry has many shallow

riffles and is called Central Zone since it contains a mixture of pasture, woodland and some arable fields and is essentially transitional in character to the zone downstream.

From Tillicoultry the Devon has 18.6 km to run to its confluence with the Forth. This Lowland Zone is predominantly arable with some pasture and stretches of deciduous trees and scrub along the bank. The river is typically fairly deep and slow moving and often fringed with tall, marshy vegetation. There are several pools by the riverbank at Alva and at Cambus.

Apart from the construction of Castlehill Reservoir the only obvious changes in the habitat during the period of the surveys have been the appearance of Oilseed Rape in the arable areas and the felling of deciduous woodland along some 250m of the Torrent zone. Fish farms have been in operation in sections H and K throughout the survey period.

METHODS

At the first survey observers were issued with two types of recording form and duplicated maps of the section(s) for which they had taken responsibility. The boundary points between the sections were: A/B NS 858959, B/C NS 884962, C/D NS 911964, *DIE* NS 943974, E/F NS 968969, F/G NS 993986, G/H NT 017995, H/J NO 012018, J/K NN 980050.

The first form was for a group of 15 species that were known to be largely restricted to waterside habitats, the names of these "primary" species were printed on the form. The second form was identical except that no species names were printed; it was for the recording of all other species. Numbers were entered according to the size of the group encountered and also into one of three columns depending on whether the birds were first noted on or above the river, on the bank, or within the environs of the river - this was taken to be within one hundred yards of the riverbank. If there was any positive indication of territoriality the record was circled; this was usually indicated by song but any other signs of nesting would be relevant, e.g. a duck with a brood. The maps were intended for use only with the 15 primary species, each separate record was plotted on the map using an abbreviated code and circled if territoriality was noted.

In the partial resurvey of 1979 interest was centred on the comparison of numbers; moreover it was felt that mapping was potentially misleading when only one recording visit was being made and so the maps were used only for navigation, the two types of form were issued with the same instructions. The complete survey of 1982 and the almost complete one in 1987 were also performed using this method. The first three surveys were done during good weather whereas in 1987 work on the first day was performed under poor conditions with wind and rain, however this affected only three of the sections, the rest were in weather

comparable to that on the previous surveys. Detailed inspection of the results rather surprisingly did not show any striking effect of the poorer observation conditions, the feelings of the observers were presumably more affected than their recording efficiency or the activity and conspicuousness of the birds. In the analysis that follows little use has been made of the recording distinctions concerning territorial behaviour or exact location on river/bank/environs. This is due both to reservations about the reliability of the distinctions in field conditions and to the fact that they were not made systematically in the later surveys. Similarly the division of species into primary species versus others has not been followed in the analysis of the data.

BIRD DISTRIBUTION ALONG THE RIVER DEVON

Each species has 36 entries over the whole period and over 80 species were recorded. Simple comparison of sections is made difficult since not everyone was counted each year. A major subject of interest concerns the way birds occur across the four main ecological zones - Lowland, Central, Torrent and Hill. For species where plenty of data were available each year was taken in turn and the numbers and distance surveyed for each zone were used to calculate the numbers for a standard distance (10 kilometres) - such a figure is henceforth called a frequency. Then the average frequency over all four years was calculated for each zone. These results are presented in Table 1 and form the basis of much of the discussion. Other species are listed in Table 2 as the total numbers per zone over all four surveys with the total length of survey given for each zone so that comparison can be made with species in Table 1.

The interpretation of this sort of data has many problems. These may arise from random variation, which particularly affects the scarcer species, and also from variation in observation conditions and the judgement of different observers. It is particularly important not to take a frequency per 10 km as an absolute measure of the abundance of birds since with a single visit method it is very likely that some territories are missed as well as there being uncertainty about the territorial status of many records. All the interpretations in this paper are based on comparisons of frequencies between zones, years or species.

If the ten individual survey sections along the river are examined, each species in turn, then there are occasional discrepancies that can be explained only in terms of variations among observers. When, however, the sections are amalgamated into zones or whole years the erratic variation largely vanishes since no particular observers consistently worked particular zones and the effect of any single section count is averaged out. There are in fact some species where the results are stable across the years whilst for most the distribution patterns across the four zones are obvious and consistent. My own

judgement is that conclusions are fairly reliable provided that they are based on large differences in the frequencies and evaluated on the basis of personal knowledge of the area and the way the surveys were conducted.

	Habitat Zones			
	Lowland	Central	Torrent	Hill
River length (km)	18.6	8.1	14.6	12.5
" gradient (m/km)	1.0	3.3	7.9	24.3
Species				
Lapwing	30.0	9.7	2.6	22.0
Common Sandpiper	3.7	3.1	3.7	14.0
Redshank	3.7	0.6	1.4	11.0
Moorhen	4.0	8.8	2.0	0.2
Sedge Warbler	17.0	1.6	0.5	0
Willow Warbler	13.0	19.0	24.0	9.2
White throat	6.1	4.4	0.2	0.6
Great Tit	2.1	5.9	4.6	1.6
Blue Tit	4.3	5.3	9.7	0.4
Wren	4.6	9.4	9.6	1.4
Dipper	0.8	5.0	9.1	8.6
Song Thrush	3.4	3.1	6.3	0.8
Blackbird	14.0	16.0	21.0	1.0
Robin	1.2	6.0	4.3	1.8
Dunnock	2.9	2.8	2.9	0.4
Pied Wagtail	5.3	6.0	5.7	5.6
Grey Wagtail	0.8	6.3	5.5	1.8
Chaffinch	13.0	45.0	48.1	11.0
Reed Bunting	5.8	0.6	2.6	2.2
Yellowhammer	1.8	2.1	4.5	1.3

Table 2. Records of species that were too scarce to warrant calculation of frequency per 10 km or where the interpretation of counts is uncertain. Counts are summed for each habitat zone over all four census years and the equivalent total length of transect is given.

1. indicates great variation in count from year to year.
2. doubt whether species breeds in surrounding area.
3. counts do not reflect numbers breeding in survey band.
4. special comment in text.
5. no count made in 1979.
6. includes estimates for 1977 & 1979.

	Habitat Zones			
	Lowland	Central	Torrent	Hill
Transect length (km)	69.4	32.4	39.4	50.0
Species				
Great Crested Grebe	0	0	0	2 (2)
Heron	8	14	3	3 (3)(4)
Mute Swan	15	0	0	0 (3)
Whooper Swan	1	0	0	0 (2)
Shelduck	7	0*	0	0 (3)
Wigeon	0	0	0	17
Teal	1	0	0	43
Mallard	139	63	59	98 (1),(3)
Tufted Duck	6	0	1	7 (3)
Pochard	0	0	0	2 (2)
Goosander	0	0	0	3
Sparrowhawk	0	0	2	0
Buzzard	0	1	0	0 (2)
Kestrel	1	0	3	4
Red Grouse	0	0	0	3
Grey Partridge	22	0	4	12
Pheasant	3	6	7	0
Coot	2	1	0	1
Oystercatcher	50	23	17	10
Ringed Plover	0	0	0	13
Snipe	3	2	0	12
Curlew	5	14	10	65
Black-headed Gull	30	32	89	175 (1),(2)
Common Gull	24	2	0	265 (1),(4)
Lesser Black-Backed Gull	11	14	3	72 (1),(2)
Herring Gull	6	0	0	20 (1),(2)
Great Black-Backed Gull	0	1	0	4 (2)
Common Tern	0	0	0	7
Feral Rock Dove	42	0	4	1 (1)
Stock Dove	8	6	0	0
Woodpigeon	67	59	65	13 (3)
Collared Dove	15	6	0	0

	Habitat Zones				
	Lowland	Central	Torrent	Hill	
Transect length (km)	69.4	32.4	39.4	50.0	
Species					
Cuckoo	0	1	1	1	
Swift	26	35	57	21	(1),(3)
Green Woodpecker	2	0	1	0	
Greater Spotted Woodpecker	0	0	2	0	
Skylark	62	3	4	37	(4)
Sandmartin	246	218	60	13	(1),(4)
Swallow	97	26	65	39	(1),(3)
House Martin	12	3	41	64	
Tree Pipit	0	0	2	1	
Meadow Pipit	1	0	0	137	(5)
Whinchat	8	0	0	33	
Stonechat	1	0	0	2	
Wheatear	0	0	0	40	
Mistle Thrush	5	0	3	1	
Garden Warbler	2	6	2	0	
Blackcap	3	2	2	1	
Blackcap/GW		4			
Goldcrest	0	0	1	0	
Spotted Flycatcher	5	17	15	3	
Long-tailed Tit	1	10	4	1	
Coal Tit	1	4	10	1	
Treecreeper	2	9	2	0	
Magpie	10	3	0	0	
Jackdaw	11	5	31	5	(3)
Rook	4	35	131	34	(1),(3)
Carrion Crow	41	39	45	25	(3)
Starling	695	311	76	22	(1),(3),
House Sparrow	37	5	3	0	(1)
Tree Sparrow	1	0	0	0	
Greenfinch	12	1	10	0	
Goldfinch	3	1	1	0	
Siskin	0	0	1	0	
Linnet	11	0	2	0	
Twite	0	0	0	14	
Redpoll	6	1	10	5	
Bullfinch	1	5	3	0	
Total number of species breeding*					

includes species in Table 1, judgement on status according to background knowledge of area and regularity of occurrence.

DISTRIBUTION ACROSS MAJOR HABITATS (Tables 1 and 2)

Lapwings were very common in the Lowland and Hill zones where there is open ground about the river, irrespective of whether it is arable or rough grassland. The records in Table 1 include post breeding flocks (NB: scientific names of the species can be found in the Forth Area Bird Report in this volume). Ringed Plovers were in small numbers only around Upper Glendevon Reservoir.

Both Oystercatcher and Curlew occured along the whole length of the river; their total numbers are similar, 20 to 30, but Oystercatchers were mainly in the Lowland and Central zones and Curlews in the Hill. Snipe were encountered only in small numbers, primarily in Hill Zone with a few records in Central.

Common Sandpiper and Redshank were equally common in the Lowland Zone and both reached maximum abundance in the Hill Zone. However they differ in that Redshanks tended to avoid the middle zones, where there are many trees, whereas the sandpipers were as frequent there as in the Lowland. Dippers were scarce in the Lowland Zone and presumably require a home range that includes shallow water: unlike sandpipers they were as common on the Torrent as in the Hill Zone. Moorhens were scarce in the Hill Zone but were otherwise generally distributed with peak frequencies in Central.

Mallard (Table 2) were by far the commonest duck, well distributed and with broods seen frequently. Small numbers of Goosander, Pochard, Wigeon, Teal and Tufted Duck were recorded in the Hill Zone; the last two species were also noted near the mouth of the river as were small numbers of Shelduck. Mute Swans used to nest by Lowland Devon but persistent disturbance has driven them away.

In the Hill Zone the island in Upper Glendevon Reservoir is notable for a small colony of Common Gulls together with the occasional pair of Lesser Blackbacked Gull and Common Tern. Twenty-five pairs of Common Gulls were noted in 1977, other records are more difficult to interpret but there were 34 birds around in 1987 with many more in 1982 but fewer in 1979.

Woodpigeons were found commonly throughout, Collared and Stock Doves were scarce and restricted to Lowland and Central zones. Cuckoo, Green and Great Spotted Woodpecker have only been recorded occasionally.

Willow Warblers were the most abundant warbler and generally distributed though least frequent in the Hill Zone. By contrast Whitethroats were scarce above the Central Zone and Sedge Warblers were largely concentrated in Lowland, indeed the latter species has been recorded above the Central zone on only one of the surveys. The other common passerines that haunt scrub and trees show distributions whose pattern

either closely resembles that of the Willow Warbler (Great and Blue Tit, Wren, Chaffinch) or deviate slightly from it (Song Thrush, Blackbird, Robin, Dunnock). Whinchats and Wheatears were recorded regularly in the HOI Zone (with two Stonechats in 1977) and in 1977 some Whinchats and a single Stonechat occurred in Lowland. Skylarks were common in Lowland and Hill Zones, the figure for the latter is misleadingly low since here the survey area was largely restricted to the steep valley around the river and most Skylarks were on the gentler slopes beyond. The Meadow Pipit was one of the most abundant passerines but almost entirely restricted to the Hill; a few Tree Pipits occurred in the Torrent Zone. The Pied Wagtail shows a remarkably even distribution throughout the river whereas the Grey Wagtail was equally as frequent in Central and Torrent Zones but less common in Hill and decidedly scarce in Lowland. Both species of bunting were well distributed but whereas the Yellowhammer peaked along the Torrent Zone the Reed Bunting was commonest in Lowland.

Bullfinches, Redpolls, Linnets and Greenfinches occurred in small numbers, only the Redpoll was recorded in Hill whilst Linnets, like the much scarcer Goldfinch, were mainly in Lowland. There was one record of Siskin, in the Torrent Zone. In 1987 several small parties of Twite (total 14) were found around Lower Glendevon Reservoir and presumably were breeding nearby.

Sand Martins were recorded in all zones but mainly close to where they nest in the river bank; the notes are difficult to compare systematically but suggest some 45 nests along the Lowland and 67 in Central Zone in 1977 with comparable numbers in the samples of 1979 and 1982 but probably fewer in 1987. Swifts, Swallows and House Martins were also recorded throughout but their status often doubtful, however the two hirundines were certainly nesting as high as Lower Glendevon Reservoir. Starlings, Rooks and Jackdaws were seen in post breeding flocks all along the river, as were smaller groups of Carrion Crows which were also likely to be nesting outwith the survey area.

USE OF THE RIVER BY SELECTED SPECIES

Many of the original survey forms contain information about whether a particular bird was first seen in or above the river, on the banks or within the general environs. The distinctions are not easy to make on some stretches of the river and, since many records are of birds that were seen only after being disturbed, the escape behaviour of a species will affect the data. Dippers and Common Sandpipers, especially, were likely to fly away low over the surface of the river. I have selected several species that were in the original list of river specialists and, wherever possible, closely related species for comparison. The results are in Table 3. Given the problems of distinguishing the three sub-habitats and of biases due to escape

behaviour, it is probably best in general to take the River and Bank categories together. Redshanks clearly use the Environs far more than Common Sandpipers, the latter species is more strictly riverine than the Moorhen whilst all the records of Dipper refer to the River itself. Yalden (1986 a,b) found that Common Sandpipers in the Peak District fed more on grass fields than at the river edge but only when the grass was very short in the spring. Thus the difference from the Devon results may be due to subtle differences in grazing regime or purely a seasonal effect.

The much greater use of the River by Grey as opposed to Pied Wagtails probably is a true reflection of habitat preference. Sedge Warblers appear to be Bank specialists whilst most of the Whitethroats and Willow Warblers are recorded in the Environs. Reed Buntings and Yellowhammers show a similar difference in preference.

These findings are in close accord with the equivalent data for Glen Clova (SOC Dundee 1979) and with general field experience, although some of the species differences could well be exaggerated due to the methods used in recording.

Table 3. Percentage of records of selected species referring to particular parts of the survey zone.

	% River	% Bank	% Environs	Total Records
Common Sandpiper	85	15	0	38
Redshank	24	15	61	33
Moorhen	85	4	11	55
Pied Wagtail	39	39	22	72
Grey Wagtail	74	16	9	43
Dipper	100	0	0	72
Sedge Warbler	3	68	30	105
Whitethroat	0	17	83	23
Willow Warbler	0	21	79	145
Reed Bunting	14	59	27	44
Yellowhammer	0	16	84	25

CHANGES ACROSS THE YEARS

I calculated frequencies for each year for the whole river and also examined section comparisons to check on consistency. The detailed results are not presented here, just comments on the features that are very clear cut.

The waders show little change from year to year with the exception of Redshank which declined from a high of 7.1 per 10 km in 1982 to only 2.2

per 10 km in 1987. The drop was especially notable in Hill Zone, there is no obvious local explanation but the 1987 population index for the UK was markedly low (Marchant et al 1990).

Moorhens were strikingly numerous in 1977, about seven times as common as in 1979 and 1982 when the populations above the Central zone practically disappeared; the 1987 total is somewhat higher but with the increase being restricted to the Lowland zone. The Waterbirds Survey shows a small drop nationally after 1977 (ibid).

A number of small birds were notably common in 1977 : Sedge Warbler, Whitethroat, Dipper, Blackbird, Robin and Reed Bunting; all these species were much scarcer in 1979 which was also a poor year for Blue Tit, Wren and Song Thrush. Most of these species recovered in 1982/87 to near the general average total with the exception of Whitethroat and Reed Bunting whose numbers have stayed low. Numbers of Pied Wagtails remained fairly stable in contrast to Grey Wagtail which was very scarce in 1979 and notably common in 1987. Dunnock, Chaffinch and Yellowhammer have changed little in total frequency; Willow Warblers were very constant for the first three survey years but the 1987 total was half the average - in six out of nine census stretches the 1987 figures were the lowest of all surveys conducted. Whinchats showed a similar decline in 1987 though on a much smaller sample. By contrast, Wheatears increased over the years and in 1987 were almost twice as common as the average.

DISCUSSION

Most of the distribution patterns along the river fit the generally accepted picture (Fuller 1982), notably in the requirement of terrestrial species for scrub and trees as opposed to open ground. The River Devon covers the full range of riverine habitats mentioned by Fuller, thus Hill and Torrent zones in this paper fit into the upland category whilst the lowland categories correspond. Fuller found that Little Grebes and Sedge Warblers are, in northern Britain, restricted to still water and absent from rivers. The Devon surveys contradict this conclusion for Sedge Warblers; fifty years ago Rintoul and Baxter (1935) noted this species as a typical breeding bird on rivers and burns in the Forth region. Apart from this the bird communities described here are typical of Fuller's account of lowland and upland rivers in northern Britain. The majority of passerines that haunt scrubby vegetation occur at a high frequency in the Torrent Zone, however Sedge Warbler and Whitethroat appear as specialists of the two lower zones even though some apparently suitable habitat is available higher up. It is noticeable that Redstart, Chiffchaff, Wood Warbler and Jay were never recorded during the Devon surveys. This reflects my personal experience that Redstart and Jay are very uncommon breeding species in Clackmannan District whilst the two warblers are local and their prime habitat is scarce close to the river.

It is worth comparing the Devon results with surveys of parts of two river valleys in Perthshire, Strathbraan (Henty 1975) and Glen Clova (SOC Dundee Branch 1979). In the two latter glens the river itself is similar to the Devon in the Torrent Zone, however, although Strathbraan has varied scrub and woodland habitats, Glenclova is more open with steep rocky hillsides close to the river while woodlands are restricted to Birch Betula sp. and to conifer plantations. The wader populations are similar in all three rivers but the Devon has more species of ducks, largely reflecting the reservoirs in Upper Glendevon. All the glens have Goosanders but only Glen Clova has records of Red-breasted Merganser. The small bird populations of Glendevon and Strathbraan are very similar as far as generally common species are concerned, leaving aside species confined to the Devon's Lowland Zone, but Glen Clova lacks Blue Tit, Goldcrest, Garden Warbler and Blackcap whilst Hedgesparrow and Wren are very scarce, as is Moorhen. Ring Ousels occurred only in the Glen Clova survey, presumably since suitable habitat is close to the river; less explicable is that Song Thrushes are about as common as Blackbirds in Strathbraan and Glen Clova whilst Mistle Thrushes are by far the commonest thrush in Glen Clova. Pied Wagtails are common in all three glens, but whereas Grey Wagtails are almost equally frequent in Glendevon they are only one-third as common as Pieds in Strathbraan, and in the Glen Clova survey there is only one record. This result is consistent with the finding (Ormerod and Tyler 1987) that Grey Wagtails favour streams that are lined with deciduous trees, as well as being shallow. The detailed results from the Devon that this species is most frequent in Central and Torrent Zones (Table 1) and is often seen on the river itself (Table 3) also support the conclusion that the Grey Wagtail has a complex habitat preference.

Table 1 shows that the Common Sandpiper has no strong requirement for shallow water in contrast to Dipper and Grey Wagtail. Yalden (1986 a) noted the importance of the river margin as a feeding site for sandpipers. The numbers of Dippers recorded overall along the four river zones correlate well with the numbers of pairs that were found in 1987 (Newton 1989) except that slightly fewer birds than nests were noted in Torrent and rather more birds in Hill Zone, this may reflect the greater opportunity for birds to forage up side streams in the Torrent Zone. The distribution is in accord with the findings of Round and Moss (1984) and of Marchant and Hyde (1980) that the density of Dippers correlates positively with river gradient and rapids. In 1987 the nest density along Torrent Zone was 11.6 per 10 km which is greater than any Scottish studies in Thorn (1986); Rintoul and Baxter (1935) stated "we have seen more Dippers in places on the River Devon than in any other part of the (Forth) area".

The effect of the hard winter of 1978/9 dominates the differences among years. Most species recovered in the next 3 to 8 years with the notable exception of Reed Bunting whose national population has stayed low in the nineteen-eighties, as shown by the Waterways Birds Survey (Marchant

et al 1990). The high local numbers of Whitethroats and Sedge Warblers in 1977 reflect the national picture and so does the striking drop in Willow Warbler numbers in 1987 (BTO News 155 p8). However the local data do not always fit the national indices; thus Moorhens did not show any dramatic decline nationally in 1979 whilst the general scarcity of Grey Wagtails in 1982 was not apparent on the River Devon - nor was it on the Wye (Ormerod and Tyler 1987). The very low numbers of Moorhens on the Devon in 1979 and 1982 were after hard winters and also correlate with the disappeance of the Coot. The partial recovery in 1987 was limited to the Lowland Zone, it may be significant that during the period of these surveys Mink *Mustela vison* have become notably common on Central and Torrent Zones (R.Young, pers. comm.) which suggests that Mink predation may be preventing Moorhens from recolonising previously suitable stretches of river.

Considering known changes in bird distribution in the Devon Valley over the previous thirty years, these surveys have picked up the colonisation of Green Woodpecker and Collared Dove and confirm the local extinction of Corn Bunting and Corncrake.

CONCLUSION

Whilst noting reservations expressed about the limitations of these surveys and the data that resulted, it can be stated that there is now a fairly complete qualitative account of the breeding avifauna of the River Devon between 1977 and 1987 together with a good description of the relative abundances of species and their distribution across the four major habitat zones. There is also evidence of various changes in abundance, some transient and some steady, during the ten years and the whole data base should act as a bench marker for studying longer term changes. So far the changes in farming practice and other land use have had no clear effects on the bird community but the experience of conservation problems over the last thirty years makes it clear that vigilance is needed.

At least sixty people must have taken part in the four surveys and this analysis clearly depended totally on their skill and enthusiasm. Special mention should be made of the committee who organised the first survey: R.J.Young (Chairman), H.Robb (Vice-chairman), A.B.Mitchell (Secretary), C.E.Earth, Miss E.M.Lapthorn, A.D.McNeill and D.Thorogood. Each year Strathdevon School was used as a base through the good offices of R.J.Young and the Central Regional Council. I am grateful to the University of Stirling for providing facilities for computing and word processing.

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THE WILD FLOWERS OF BALMERINO PARISH, FIFE 150 YEARS OF CHANGE

G. H. Ballantyne

A plant list for Balmerino parish in N.E. Fife totalling 470 species was published in 1867, incorporating a much shorter list compiled in 1838. A survey during the 1970/80s found some 350 still extant and revealed a further 115 not previously recorded. Possible explanations for the loss of 120 species and an account of the present position are given, both arranged by habitat.

INTRODUCTION

Balmerino parish occupies about 4 miles of the south shore of the Firth of Tay, not quite opposite Dundee, and at its widest extends southward some 2V2 miles across the North Fife hills. In the parish, these hills rise to a little over 190 m and consist mainly of lavas of Old Red Sandstone age. They form the eastern outpost of the Ochil Hills (which reach over 770 m (2,300 ft) some 30 miles to the west in Clackmannan), provide viewpoints for magnificent panoramas, especially to the north and west, and vantage points to see the surrounding intensively farmed countryside, with its limited rough grazing and varied plantations. Only small areas of broadleaved woodland exist, mainly along the shore, which consists chiefly of low cliffs. The parish is roughly crescent-shaped, with the curve to the south, and occupies about 5 ¥4 square miles (14 sq km).

There are only two communities of any size. The village of Gauldry, recently doubled in extent, is on the ridge of hills, and the hamlet of Balmerino, with its ruined 13th century Abbey, is on the shore. The church, built in 1811, is a little distance inland at Bottomcraigs, adjacent to the small estate of Naughton. To its east, the ground is lower and open, whereas the more extensive lands of Birkhill, which make up the western end of the parish, are markedly undulating and well wooded. The only watercourse of any consequence is the Motray Water, which forms most of the short southern boundary. A colourful description of the parish is given by Muir (1955).

BACKGROUND

During the first third of the 19th century the local botanist in Fife had very little published information to guide him where to look for plants. The New *Statistical Account* (NSA) written between 1836-45 helped to a degree as some of the compilers included plant lists, notably for the parishes of Dunfermline, Inverkeithing, Burntisland and Collessie, although many mentioned few or no plants at all. After 1860, the position improved. Wood (1862) produced *The East Neuk of Fife* and incorporated a reasonable (though

sometimes inaccurate) list for that area. A year later, Balfour and Sadler (1863) issued their *Flora of Edinburgh* which mentioned many plants from south and west Fife. Then Charles Howie included in Ballingall (1872) what could be described as the first flora of Fife, although this omitted many localities and was really quite a poor effort.

Parts of North Fife were catered for by two lists that appeared in the 1860/70s, by which time the vogue for comprehensive parish accounts was well under way. The history of Balmerino by the local minister, James Campbell (1867), contained a list of plants by James Berwick amounting to some 470 species; and the history of the Newburgh area by Alexander Laing (1876) included a list of 275 species.

When other sources for Balmerino parish are considered, the total recorded for the 19th century approaches 500. This is a large figure and it prompted a survey to be carried out during the 1970/80s so that a comparison could be made, particularly from the point of view of habitat change. Thus the following account is divided into two, Part 1 being devoted to plants seen in the 19th century, principally by Berwick, and Part II dealing with the position in the last quarter of the 20th century.

PART 1 THE 19th CENTURY

Apart from a few trees, the first mention of plants from Balmerino is in the NSA (1845), compiled in 1838 by the Church of Scotland minister, John Thomson. 30 species were listed, divided between those growing on the shore and those growing in other places. Some are distinctly uncommon while the following seven are almost certainly errors - *AHsma plantago-aquatica, Artemisia maritima, Cochlearia anglica, Desmazeria marinum, Euphorbia paralias, Geranium sylvaticum* and *Hordeum marinum.*

Although Thomson may have been responsible for including these, he may have got the names from his fellow minister, John Anderson in Newburgh, just to the west. Anderson's list for his own parish contains several mistakes, while his list in Leighton and Swan (1840) mentioned *Geranium columbinum* and *Reseda lutea* from Balmerino; the former is a possible error, the latter a certain one. Thus the recording of the parish flora did not get off to an auspicious start, but this was to be remedied some 30 years later.

JAMES BORWICK

Thomson was succeeded as parish minister in 1857 by James Campbell and he soon began to write a comprehensive history of the parish. The first edition of 433 pages appeared in 1867, with a much enlarged second edition of 692 pages in 1899. Included in both was an appendix 'Botany of the Parish', compiled by James Berwick. The plant lists for the two editions are identical except for one addition in 1899.

Berwick was born in 1813, probably in Kirkwall in Orkney, as he came from there to attend Edinburgh University in 1827. He spent five years studying Theology, and in 1837 was ordained, at the age of 24, as pastor of the United Presbyterian Church in Rathillet, a tiny community in the parish of Kilmany, with responsibility for the neighbouring parishes of Balmerino, Creich, Flisk and Logie. He soon married Agnes Mackenzie, and they had six daughters, but as she died in 1854 at the age of 36, he had the considerable responsibility of bringing them up. He appears to have been conscientious in carrying out his pastoral duties and was well respected. After 45 years as minister, in 1882 he became ill and retired to Newport, where he died on llth February 1884 in his 71st year.

BORWICK'S LIST OF 1867

It is not known when Berwick developed an interest in botany; maybe he simply began to note what he saw as he went his rounds throughout the five parishes. About 1863/4, because he had "devoted much attention to the Botany of the district", Campbell (1867 p 339) invited him to contribute a list of plants to his parish history. Just how competent a field botanist Berwick was can only be surmised - he did not become a member of the Botanical Society of Edinburgh and it seems he was largely self-taught. His list betrays some carelessness in compilation - there are several curious omissions, notably of common trees - and it seems certain that some of his entries are errors. This may have been due to the inadequacy of whatever book(s) he used for identification; it must be remembered that there was a very limited choice in the mid-19th century.

Either Campbell or Berwick at some stage enlisted the help of the Rev James Farquharson of Selkirk (1832-1906), a botanist of some note. He contributed 20 species to the final list and went over it to decide which plants were to be classed as non-native (missing several in doing so, however). It seems odd that he did not draw attention at least to the more obvious omissions, especially as a number of them were introduced plants. Thus Berwick's list does have some shortcomings but, taken as a whole, it is of real value because it contains so many plants, including grasses and sedges which are so often overlooked or ignored.

Including the nine plants mentioned earlier (mostly NSA), Berwick's total came to some 470 species. It might have been more, for "Mr Berwick desires it to be stated . . . that there are some portions of the parish which he has not examined" (ibid), which has also been the case in the recent survey. Because he was responsible for four of the five neighbouring parishes, Berwick possibly included some plants that did not grow within Balmerino's bounds. Certainly, some that have not been re-found do occur not far from the parish, but loss of habitat appears to be the chief reason for the disappearances.

About 350 plants have been rediscovered, which leaves some 120 that,

on the face of it, have been lost. However, the actual total of native species is only about half that figure, taking into account introductions, weeds and casuals that are no longer found, and probable errors. These losses are an important - and disturbing - feature, and they are now listed, mostly by habitat. Occasionally, allocation to a particular category has been somewhat arbitrary; also, the advice of Allen (1981) that "the hardest discipline for any compiler ... is to avoid being hypnotised by names" has been heeded. Nomenclature is according to Clapham, Tutin and Warburg (1981).

(a) Losses - Wet and Damp Places

Achillea ptarmica
Alopecurus aequalis, A. bulbosus
Carex demissa, C. *echinata,*
C. *hostiana,* C. *limosa,* C. *nigra*
C. *penicee,* C. *pulicaris*
Crepis paludosa
Dactylorhiza tuchsii, D. *purpurella*
Dryopteris carthusiana
Eleocharis multiceulis, E. *palustris*
Epilobium obscurutn, E. *parviflorum*
Erica tetralix
Eriophorum angustifolium
Galium pelustre, G. *uliginosum*
Hydrocotyle vulgaris
Isolepis setacea
Menyanthes trifoliata
Myosoton aquaticum
Pedicularis palustris
Pingucula vulgaris
Polygonum hydropipet
Potentilla palustris
Ranunculus aquatilis (s.l.)
Sagina nodosa
Scirpus sylvaticus
Scutellaria galericulata
Stellaria palustris
Triglochin palustris
Veronica scutellata

Drainage of wet areas had begun before the end of the 18th century - "now the bogs are almost all drained" (Statistical Account 1793). The process continued during the next 50 years - "there is neither bog nor marsh . . . no river or stream of any consequence passes through the parish" (NSA 1845). Thus by the time Berwick was investigating the flora in the mid-19th century, there appears to have been only about half-a-dozen small ponds, mainly for the use of mills and farms, a curling pond, and the few small natural burns. Damp ground and flushes in the hillier areas would have provided suitable habitats for several of the above plants, but it is difficult to reconcile the presence of bog-loving species with the previous drainage, particularly *Carex limosa* and *Eleocharis multicaulis.* These may be merely wishful thinking. The two *Alopecurus* species must also be mistakes, as must *Myosoton,* although this may have been a misidentification for *Stellaria nemorum.* Also, the ponds may have been larger in those days, with marshy fringes, and this would account for such plants as the *Galium* species, *Hydrocotyle* and others. It is possible, too, that Berwick included plants from the banks of the Motray Water, which flooded regularly below Rathillet, close to his home; most of this ground is in Kilmany parish.

(b) Losses—Moor and Grassland

Antennaria dioica
Botrychium lunaria
Brize media
Carex caryophyllea
Empetrum nigrum
Erica cinerea
Gnaphalium sylvaticum
Juncus squarrosus
Leontodon hispidus
Nard us stricta
Pedicularis sylvatica
Radiola linoides
Rhinanthus minor
Salix repens
Solidago virgaurea
Teesdalia nudicaulis
Viola lutea

It is unclear how much of the parish was cultivated at the beginning of Berwick's ministry in 1837. Then, the NSA asserted that some 80% was "in cultivation", 14% was wooded and a mere 6% was "unarable, roads, etc." This is a very low figure, and much of the "cultivation" must have been grazing land, especially as most of it was still unenclosed. Campbell says that Gauldry was built on a moor, and this is borne out by the 1854 OS map, that shows moory tracts in that vicinity. There are also various pockets of at least rough pasture scattered throughout the parish, notably on Green Hill, Fin Craigs and Scurr Hill. Thus it is probable that most of the above plants did occur, although some are rare, particularly the *Antennaria, Botrychium, Radiola* and *Teesdalia.* There are doubts about the *Radiola* - it certainly was present (and probably still is) on Tentsmuir, about 8 miles to the east, but it is unlikely that it occurred within the parish boundaries.

Campanula rapunculoides
Cheirenthus cheiri
Geranium lucidum
Hypeticum calycinum
Lamium maculatum
Lathyrus latifolius
Lepidium latifolium
Mentha x *piperita*
M. x *villosa*
Muscari racemosum
Sedum reflexum
Sempervivum tectorum
Senecio fluviatilis
Spiraea salicifolia
Tulipa sylvestris
Valeriana pyrenaica

A question mark must be placed over some of these, as all are rare or very rare in Fife. It is just possible that Corbie Den, the western parish boundary, in the past could have supported such species as the *Melampyrum, Rubus* and *Vicia* (and perhaps *Milium effusum,* seen recently in small quantity in another part of Birkhill estate, but possibly introduced). In particular, although it is found over the Tay in two Angus dens, Borwick's is the sole VC85 record for *Vicia orobus* and it seems best to disregard it. There must be doubt too that *Polystichum setiferum* or *Hypericum maculatum* actually occurred. The *Cryptogramma* is both odd and doubtful, as it is the only addition to the second edition of 1899 (from Scurr Hill), without any authority. Nearby, however, *Gymnocarpium dryopteris* may well have grown on "Rocks at Bottomcraig"; and *Epipactis helleborine* at Birkhill is quite likely.

(d) Losses - Shore

Astragalus danicus
Avenvla pratensis
Campanula glomerata
Carex distans
Cochlearia officinalis
Daucus carota
Eupatorium cannabinum
Geranium pratense
Scirpus lacustris
Sedum rosea
Vicia lathyroides

Balmerino's western shoreline from near Balmerino Burn to beyond the parish boundary at Birkhill Pier, has been wooded since at least 1812. To the east, although there has long been a narrow strip of trees for part of the way, there are also sea-braes, so some of the above possibly grew there. A few may have grown nearer Wormit, in Forgan parish, especially the *Astragalus, Eupatorium, Carex* and *Vicia,* all recorded there in the 1890s, along with *Cochlearia. Scirpus lacustris* may have been the closely related *S. tabernaemontani,* which occurs further west. The acceptance of *Sedum rosea* and *Campanula glomerata* presents problems. The former is a plant of mountains or sea-cliffs and it seems unlikely that the sparse low cliffs east of Balmerino could have supported it. Neither are there any records for the Angus cliffs not far to the north-east, which seem much more suited to this species. *Campanula glomerata* also flourishes on cliffs, often on grassy ledges; as there is one such extant site on the Forth, it may be that this bell-flower did occur. Alternatively, it could have been an escape.

(e) Losses - Weeds and Casuals

Agrostemma githago
Anthemis arvensis
Artemisia vulgaris
Bromus commutatus
Carduus acanthoides, C. *nutans*
Carum carvi
Centaurea cyanus
Chenopodium polyspermum
Conium maculatum
Convolvulus arvensis
Hordeum murinum
Lamium molucellifolium
Lithospermum arvense
Lolium perenne, ssp. *multiflorum*
Malva neglecta
Melilotus officinalis
Rumex palustris
Scandix pecten-veneris
Valerianella dentata

Any area will always have its quota of accidentally introduced plants; many of these are ephemeral annuals, although some may last for several years. Most persistent are weeds of cultivation (particularly those formerly associated with grain crops) such as the *Agrostemma, Centaurea, Lithospermum, Scandix* and *Valerianella,* all sadly extinct for many years. Another probable source of casuals was flax, widely cultivated in the parish at least to the late eighteenth century, and elsewhere in north Fife well into the twentieth. A further source was no doubt the ballast dumped around the harbour by cargo boats coming in to load grain and potatoes. This could have accounted for such oddities as *Bromus commutatus, Carduus nutans,*

Chenopodium polyspermum, Melilotus officinalis and *Rumex palustris.* Some of the above species *(Artemisia, Conium, Carduus acanthoides, Convolvulus, Hordeum, Malva)* still occur in nearby parts of Fife, so perhaps they are only temporarily lost from the parish. However, agricultural changes and especially the drastic 'tidying' of verges by the District Council, all reduce the chances of weeds establishing themselves.

(f) Losses - Introductions and Escapes

Campanula rapunculoides
Cheiranthus cheiri
Geranium lucidum
Hypericum calycinum
Lamium maculatum
Lathyrus latifolius
Lepidium latifolium
Mentha x *piperita*
M. x *villosa*
Muscari racemosum
Sedum reflexum
Sempervivum tectorum
Senecio fluviatilis
Spiraea salicifolia
Tulipa sylvestris
Valeriana pyrenaica

The *Tulipa* was reported in 1838 to have been "once abundant at the Abbey but now very rare" (NSA). The *Cheiranthus* was also there but it too has gone. None of the other species has been refound and it seems unlikely that such plants as the *Lathyrus, Lepidium, Sempervivum* and *Senecio* survive. However, one or two could still be around — *Spiraea salicifolia* grows in the garden of Naughton Lodge, but presumably this was not Berwick's locality.

Plants Omitted by Berwick

Acer pseudoplatanus
Aesculus hippocastanum
Alnus glutinosa
Castanea sativa
Festuca rubra
Fraxinus excelsior
Hyochaeris radicata
juglans regia
Larix decidua
Pinus sylvestris
Quercus robur
Ribes uva-crispa
Salix cinerea
Taxus baccata
Ulmus glabra

The above were all unaccountably omitted by Berwick. Most of the trees certainly were present - Statistical Account (1793) mentions ash, beech, chestnut and oak, while Campbell (1867) alludes to a few. In particular, both describe the old Spanish chestnut at the Abbey, and the Yew enclosure at Birkhill. At Birkhill and Naughton there are several large ornamental conifers that must be at least 150 years old; Mitchell (1972) mentions *Larix decidua* being planted at Birkhill in 1738; and Jeffrey and Howie (1879) describe several of the following, some of which had been obviously long present: *Abies* spp., *Araucaria araucana, Cryptomeria japonica, Cedrus* spp., *Pseudotsuga menziesii, Sequoia sempervirens* and *Sequoiadendron giganteum.* Particularly large *Larix decidua* and *Cryptomeria* trees still grow at Birkhill.

Confusion of Names

Berwick relied on the BSE *Catalogue of British Plants* for his names, probably using the 1851 version, although he may have had access to the 1865 edition. In some instances the name he employed is different to the one he ought to have used, while in others he did not choose the correct varietal name. The main species concerned, with Berwick's name in parenthesis, are -

Artiplex patula (A. littoralis)	*Salix aurita (S. stipularis)*
Callitriche stagnalis (C. verna)	*Scrophularia umbrosa (S. aquatica)*
Epilobium obscurum	*Symphytum tuberosum*
(E. tetragonum)	*(S. offidnale)*
Fumaria muralis, ssp. *boraei*	*Viola arvensis (V. tricolor)*
(F. capreolata)	*Viola riviniana (V. canina)*
Purnus spinosa (P. communis)	

Additionally, Berwick included four names which are not now recognised as species - *Athyrium convexum, Cystopteris dentata, Festuca duriuscula* and *Luzula congesta;* these are either varieties or synonyms.

Despite the criticisms of Berwick, it must be borne in mind that they concern only a small proportion of the species he mentions. His list is a valuable one because it includes so many plants, and thus enables a valid comparison to be made between the present day and the mid 19th century. That he apparently was wrong in some of his determinations does not detract from his work; in several instances maybe the author is being over-cautious in accepting his findings, bearing in mind the difficulty of trying to envisage what the parish was really like all these years ago.

WILLIAM AND ROBERT SMITH

During the 1890s, these two brothers from Dundee conceived the idea of compiling a Botanical Survey of Scotland. This led them to make several visits to Fife, and Robert in particular crossed the Tay to Balmerino and Birkhill Woods. Although there are a few specimens in St. Andrews Herbarium, Young (1936) has to be relied on for most of their records. It has to be said that a few are decided errors - assuming that Young transcribed their field notes correctly - e.g. *Sesleria caerulea, Ulex minor, Sium latifolium,* all from the Tayport area. Scepticism must also be cast on one or two of Robert's Balmerino records, in particular *Scilla verna* and *Galium "asperum" (=G. sterneri).* Macleay (1953) compounded this latter error by interpreting Young's "R.S." as Robert Sibbald, and so dating the record as 1710! The species seen by the Smiths, but not in Berwick's list are:

Borthwick's list are_

Fraxinus excelsior	*Ribes uva-crispa*
Galium "asperum"	*Scilla verna*
Lathyrus sylvestris	*Stellaria nemorum*
Neottia nidus- avis	*Ulmus glabra*
Prunus cerasus	*Veronica montana*
Ranunculus auricomus	

Four of these are rare in Fife. The *Ranunculus* has been seen west of Balmerino and at Naughton; but not the *Neottia* (there is a specimen in St Andrews from Flisk, just to the west of Birkhill, and perhaps this was Smith's locality); nor *Veronica montana;* nor *Stellaria nemorum* (could Berwick's *"Malachium aquaticum"* have been this?). The *Stellaria* was erroneously claimed as a New County Record for VC85 (Trail 1901).

WILLIAM YOUNG

Young, of Kirkcaldy in South Fife, was collecting and recording in the 1880-1910 period, but appears to have seldom visited North Fife. His *List* of VC85 plants (1936) contains many transcription errors, and the following, relating to Balmerino Parish, should be deleted -p. 28 *Viola hirta* - "Balmerino (J.C.)" p. 41 *Geranium phaeum* - "Balmerino (M.)" p. 54 *Filipendula vulgaris* - "Balmerino, 1837 (Knapp)" p. 167 *Asplenium septentrionale* - "Balmerino (J.C.)"

PART II THE 20th CENTURY

BACKGROUND

During the first seventy years of the 20th century there appears to have been no botanical interest in Balmerino, apart from brief visits in the 1940s by E. Crapper from Tayport, who added *Adoxa moschatellina.* In the mid 1970s, Mary Benstead came to live in Wormit, just to the east of the parish, and she subsequently botanised widely in the area; and the author, in his capacity as Recorder for Fife and Kinross (VC85), began to visit the district from time to time. In 1988 it was decided that enough field work had been done to merit a comparison between Berwick's list and the position 120 years or so later; so some time was spent in final checking, especially with regard to critical groups, and in doing historical research. Most of the 115 species not recorded during last century are now listed by category and status, followed by a descriptive account by habitat of the situation in the late 1980s.

SPECIES NOT RECORDED IN THE 19th CENTURY

(a) Herbs - Native, or Not Introduced Deliberately

Adoxa moschatellina
Agrostis gigantea
Allium carinatum
Barbarea intermedia
Carex pilulifera, rostrata, sylvatica
Cerastium semidecandrum
Chamerion augustifolium
Draba muralis
Epilobium ciliatum
Festuca arundinacea, gigantea
Glyceria plicata
Lemna minor
Lepidium heterophyllum
Matricar Potentilla sterilis
Mimulus guttatus
Potentilla sterilis
Rumex lotigiiolius, x emottii,
R. x pratensis
Sagina apetala, ssp. apetala
Silene x intermedia
Solanum dulcamara
Sonchus arvensis
Sparganium erectum
Stachys x ambigua
Symphytum x uplandicum
Thlaspi arvense
Tragopogon pratensis
Trifolium ornithopodioides
Trisetum flavescens
Veronica Iiliiormis, persica

(b) Herbs - Introduced, Now Established or Naturalised

Antirrhinum majus
Arum maculatum
Cicerbita macrophylla
Geranium phaeum
Heracleum mantegazzianum
Hyacinthoides non-scripta x *hispanica*
Meconopsis cambrica
Montia sibirica
Pentaglottis sempervirens
Phlomis russeliana
Reynoutria japonica
Sedum album
Tolmiea tnetiziesii
Verbascum thapsus
Vinca minor

N.B. The following have occurred recently as casuals or relics -

Amsinckia micrantha
Brassica napus
Impatiens glandulifera
Linaria purpurea
Lupinus polyphyllus
Rumex maritimus
Solanum nigrum
Trifolium hybridum

(c) Trees - Introduced

Acer platanoides
Carpinus betulus
Chamaecyparis lawsoniana
Euonymus europaeus
Larix x *eurolepis*
Picea abies, sitchensis
Populus x *canadensis*
Pseudotsuga metiziesii
Quercus petraea, x *rosacea*
Salix alba, Iregilis, x *mollissime,* S. *pentandra,* x *sericans*
Tsuga heterophylla

(d) Shrubs - More or Less Naturalised

Buddleia davidii
Cotoneaster simonsii
Hypericum androsaemum
Rhododendron ponticum
Ribes sanguineum, sylvestris
Symphoricarpos rivuleiis

Taxonomic/Nomenclature Changes Since 1867

Segregates

Taxonomic knowledge has increased a great deal during the last hundred years and it is necessary to note segregates which were not recognised in Berwick's time. Those occurring in the parish are *Alchemilla glabra* and A. *xanthochlora; Aphanes microcarpa* (but not *A. arvensis); Arenaria leptoclados* (but not *A. serpyllifolia); Atriplex glabriuscula* and *A. prostata; Cardamine flexuosa; Dryopteris affinis; Phleum nodosum; Poa subcaerulea;* and *Polygonum arenastrum.*

Critical Groups

The chief genera present in the parish are Rosa and *Rubus.* Berwick listed *Rosa rubiginosa and pimpinellifolia,* both of which are still extant; his *mollis = villosa* and his *tomentosa = sherardii;* his *canina* is now represented by *afzeliana, caesia* and *canina* s.s. The last is the most common taxon and hybrids between it and *mollis/'sherardii* (and the reciprocal crosses) are frequent. The hybrids *rubiginosa* x *canina* and *rubiginosa* x *mollis/'sherardii* have also been detected. For the record, *Rosa arvensis* is planted on Birkhill estate. Berwick listed *Rubus caesius* and *plicatus.* The former proves to be not dewberry but one of Fife's commonest brambles, *latifolius,* while the latter may well be *nemoralis,* present at Birkhill. Four other taxa are to be found - *leptothyrsos, mucronulatus, radula* (common) and *septentrionalis. Hieracium vulgatum,* recorded in 1867, still occurs but *H. "murorum"* seems to have vanished. Similarly, *Taraxacum "palustre"* is no longer around; no attempt has been made to identify dandelions belonging to other sections. Only one eyebright has been seen recently, in insufficient quantity to determine as other than *Euphrasia officinalis.*

WOODLAND

Most of the woodland in the parish was first planted in the late 18th and early 19th centuries, except for shelter belts which are more recent additions. Present day conifer plantations consist mainly of Scots pine, spruces, larches and some Douglas fir and western hemlock. Inside the conifer stands are grasses (especially *Deschampsia flexuosa),* ferns and brambles; in some of the smaller drier broadleaved woods *Sanicula europaea* is plentiful. In clearings and round the plantations these are joined by other grasses, *Vaccinium myrtillus* (local), *Digitalis purpurea* and various broadleaved trees. Beech has been planted at the edge of many conifer woods. The only known *Succissa pratensis* is on the fringe of a larch wood, and a few plants of *Hypericum humifusum* occur on one damp trackway.

Extensive semi-natural broadleaved woodland is found only west of Balmerino, in Birkhill Woods. Away from the house, there are thickets of gean and sycamore, and oak and beech in quantity; some large elms are

still alive and ash is plentiful, especially along the shore. Many kinds of trees and also ivy and honeysuckle, together with sloe and broom bushes, hang over the cliffs. Despite the presence of roe deer and red squirrels, there are saplings of most trees. The ground flora of the broadleaved areas is rich and very like that found far to the south and west - extensive sheets of *Hyacinthoides non-scripta* and *Allium ursinum* scent the air in spring, and their pale dying stems gleam spectrally between the sycamore trunks later in the summer. *Galium odoratum* and *Stachys sylvatica* grow in quantity, and as many as 180 stems of *Orchis mascula* have been counted in one place; *Listera ovata* also occurs, as do *Anemone nemorosa, Bromus ramosus, Potentilla sterilis, Circaea lutetiana, Sanicula europaea* and *Primula vulgaris,* all otherwise mostly rare in north east Fife. Nettles, brambles and *Rhododendron ponticum* hamper walking in some places, while in others, the ubiquitous *Luzula sylvatica* overpowers other vegetation.

Ferns are plentiful and comprise mainly *Dryopteris filix-mas, D. dilatata* and *Athyrium filix-foemina* in the shadier parts. Well-lit spots have *Polypodium vulgare, Pteridium aquilinum* and also *Digitalis purpurea* (sometimes epiphytic), *Teucrium scorodonum* and some *Campanula rotundifolia. Adoxa moschatellina* has been re-found, as have one or two plants of *Clinopodium vulgare.* No *Mycelis muralis* has been discovered, despite its occurring just west of the parish at Flisk.

The lands of Birkhill anciently belonged to the Abbey but in the 16th century they passed into family ownership; later, Birkhill House was built in 1780 and extensively reconstructed during 1857-59. The first trees were introduced some 250 years ago, with the bulk dating from around 1800. There are many exotic species in the immediate vicinity of the House, particularly in the 'wild garden', a den just to its east. In late spring this is a blaze of *azalea,* rhododendron and magnolia blossom below lofty larches, cedars, cypresses and firs (the tallest of these can be seen several miles away). Of the planted ground flora, *Convallaria majalis* is still there, probably where Lawson (1848) and Berwick (1867) saw it. Other species which have spread naturally well beyond their original stations include *Myosotis sylvatica, Geranium phaeum, Pulmonaria longifolia* and *Polygonum campanulatum,* with rampant *Tolmiea menziesii,* the last extending right down the burn.

Native plants complement the foreigners, the most interesting being *Lysimachia nemorum, Ajuga reptans, Luzula pilosa, Poa nemoralis, Carex sylvatica* and *Blechnum spicant,* the last two found nowhere else in the parish. In the upper part of this den (and elsewhere) *Galanthus nivalis* adorns large areas before *Symphytum tuberosum* takes over much of the woodland floor. Here and there a little *Rumex sanguineus* and *Mercurialis perennis* prevent total domination, along with *Stellaria holostea* at the woodland edges. By the burn, *Phyllitis scolopendrium* is quite at home among the native ferns; *Luzula luzuloides* was seen

hereabouts in 1980. The nearby walled garden has its quota of weeds, including *Cystopteris fragilis* in and about the greenhouses, along with *Oxalis corniculata,* ssp. *corniculata.*

In the east of the parish, in the Bottomcraig area, there are some fine broadleaved groves, in one of which *Pyrola minor,* a north eastern rarity, may be found. A flourishing patch of *Montia sibirica* looks most out of place in this same wood, while behind the church, *Pentaglottis sempervirens* carpets a mixed plantation. This escape too is frequent in the small neighbouring estate of Naughton, well-known in the district for its daffodil open days. *Myosotis sylvatica* also thrives here, accompanied by both *Hyacinthoides non-scripta* and its hybrid with *H. hispanica.* East of the House, built in 1793, *Tellima grandiflora* threatens to over-run a steepish slope and nearby are a few bushes of *Buxus sempervirens, Mahonia aquifolium* and *Ruscus aculeatus;* none of these is naturalised, however. Practically nothing is left of Naughton Castle, erected on a high isolated rock in the 16th century; its remains were turned into a garden about 1900 and appear to have harboured quantities of *Draba muralis* for some time. This is a very infrequent weed in Fife. An unusual companion, possibly accidentally introduced, is *Saxifraga cymbalaria,* ssp. *huetiana,* from S. W. Asia.

Native plants are frequent, of course, including a relation of the last, *S. granulata* on lawns, together with Ranunculus auricomus. Glechoma hederacea creeps over most of the understorey above the "beautiful picturesque dell" behind the Castle (NSA), but unfortunately this area has for some time been shaded out and is of little interest, including the north face of the rock which is mostly ivy-clad, except for a few Meconopsis cambrica and Polypodium vulgare.

Naughton has a few fine conifers and a variety of hardwoods, in particular in a narrow band by the west drive, which holds Acer platanoides, Acesculus hippocastanum, Castanea sativa, Fraxinus excelsior, Prunus laurocerasus, Quercus robur and Q. x rosacea, and Tilia x europaea. Also present in this area are Carpinus betulus and Euonymus europaeus, both uncommon in Fife.

North of Naughton, by the shore east of Kirkton, there is a narrow wooded strip which contains some species rare in north east Fife, notably Corylus avellana and Populus tremula. These were almost certainly originally planted, but two other bushes have appeared here of their own accord, viz. Cotoneaster simonsii and Ribes sanguineum, both quite naturalised. The ground flora features Galium odoratum, Primula vulgaris and Brachypodium sylvaticum, but unfortunately there is an over-abundance of ivy throughout the whole area.

Balmerino Abbey boasts a historic sweet chestnut, reputedly planted by Queen Ermengarde in 1229 (Campbell 1867/1899), but probably no more than 400 years old; it is considerably decayed and propped up.

It is surrounded by a wide carpet of winter aconite, Eranthis hyemalis, a *local tourist attraction in the early spring (cf Muir 1955). The Abbey's 750th anniversary was commemorated in 1979 by the planting of a young sweet chestnut and a young walnut, the latter being a replacement for a large venerable* Juglans regia *that blew down in 1935 (and which was subsequently used in the furnishing of St. Andrews House in Edinburgh).*

WET HABITATS

The annual rainfall is about 30" (750mm); this, and the main watershed being so close to the shore, make for few natural watercourses or marshy areas. Short burns running northward, and also a few springs, give rise to small freshwater marshes on the shore. These are dominated by Oenanthe crocata, *or sometimes* Phragmites australis, *and also contain* Carex otrubae, Arctium minus, Gfyceria maxima, Tussilago farfara, *a little* Petasites hybridus, *and occasionally alders.*

Most of the burns in Birkhill Woods are in deep dens and are too heavily shaded to yield more than bryophytes, a few ferns including Polystichum aculeatum, *and some* Chrysosplenium oppositifolium. *The longest burn - half a mile, or one kilometre! - reaches the shore at Balmerino, and near the Abbey forms meanders. Here grow* Caltha palustris, Lychnis flos-cuculi, Myosotis palustris, Iris pseudacorus, Juncus inflexus, *etc. The most distinct burn east of Balmerino is heavily poached by cattle but can still yield* Rorippa microphylla, Veronica beccabunga *and* Glyceria fluitans *before plunging down the cliff.*

The south of the parish is bounded by the Motray Water, which was channelled and banked in the mid 19th century. Here in spring, Petasites hybridus *is followed by the catkins of* Salix cinerea, caprea, alba, fragilis, pentandra *and* viminalis, *the last four originally introduced; and masses of* Silene dioica *and* Barbarea vulgaris. *In summer,* Filipendula ulmaria, Symphytum *x* uplandicum, Epilobium hirsutum, Myosotis palustris and *some weeds, particularly* Lamium album, *bring colour to the rank grasses, e.g.* Phalaris arundinacea. *An especial feature of the Motray is plentiful* Scrophularia umbrosa, a *rarity north of the Forth.*

There are few remaining farm ponds and mill-dams. Near Coultra Farm is the only pond to be fringed with some Carex rostrata *and* Sparganium erectum, *the surface often being covered by* Lemna minor. *The old mill-dam at Fincraigs is now choked by* Phragmites australis *but* Carex disticha *may still be detected, along with an interesting introduction,* Salix *x* mollissima, *probably planted 25-30 years ago and thriving and spreading. Other old ponds are now mostly marshy, with little or no open water and in part shaded either by willows or conifers; or, in the case of the former curling pond at Bottomcraigs, full of* Juncus effusus.

SHORE LINE

Except at Balmerino, the shore chiefly consists of banks and cliffs up to 70 feet (21m) high; all face north-west and most are overhung by trees. Armeria maritima *and* Festuca rubra *grow at lower levels, and* Polypodium vulgare *is in deeper clefts above the splash zone.* Hedera helix *and* Lonicera periclymenum *are plentiful;* Luzula sylvatica *occurs on some ledges, even away from woodland. The foreshore is mainly pebbly or stony, giving way to a stretch of mud then extensive sand banks. The commonest strandline plants are* Potentilla anserina, Atriplex glabriuscula *and* A. prostrata, and Rumex crispus. *No* Tripleurospermum maritimum *is found and* Sonchus arvensis *is scarce, unlike on other Fife coasts. At one place, just above HWMOST, a dense colony of* Valerianella locusta *grows in mounds up to 6 inches high.* Potentilla reptans *and* Sedum album *(an escape) grow near the shore at Balmerino, where* Allium carinatum *is also encountered (as it is at Newburgh), perhaps washed down the Tay from Perth, where it has been long known. This method of distribution may account for the appearance in 1985 of the tiny* Trifolium ornithopodioides *on a low outcrop just west of the old Balmerino pier. Another surprising discovery a year later was* Rumex maritimus *on the former Birkhill Pier, where some surface disturbance had taken place; perhaps the seeds had lain dormant for many years. A few bushes of* Solanum dulcamara *are to be found east of Kirkton.*

Only very scanty patches of saltings occur, scattered over about 14 mile (400 m) at Balmerino, and containing Spergularia marina *and* S. media, Plantago maritima *and* P. coronopus, Glaux maritima, Aster tripolium, Triglochin maritima, Festuca rubra *and* Juncus gerardii. Cochlearia officinalis, *present in 1867, is not known today nearer than Newport-on-Tay, 5 miles (8 km) downriver.*

ROCKY OUTCROPS AND BANKS

Uncultivable outcrops in fields occur here and there; the larger ones are often thickly clad with Ulex europaeus, and if they are burnt, are quickly colonised by *Senecio sylvaticus. Erodium cicutarium* (scarce), *Spergularia rubra, Trifolium striatum* (rare), *Helianthemum nummularium, Thymus praecox* and *Vulpia bromoides* are confined to this habitat. One outcrop near Fincraigs Farm, part of a quartz-dolerite sill, forms a steep, botanically distinct slope on an uncultivated hill. Here, *Ulex, Rumex acetosella, Senecio jacobaea* and coarse grasses give way to abundant *Thymus* and *Koeleria macrantha,* and also *Cerastium semidecandrum, Sagina subulata, Filago minima* and a little *F. vulgaris, Lepidium heterophyllum and Helianthemum.* (West of the parish, on the same formation, the same plants have been seen, and also *Geranium columbinum, Viola canina* and *V. lutea.*) Ardie Hill still has small pockets of rough ground which support such other species as *Cerastium arvense, Ononis repens, Trisetum flavescens, Sherardia arvensis* and *Scleranthus annuus.*

On one of the few areas of unimproved pasture, a north-facing slope east of Balmerino, grow *Primula veris* and *P.* x *tommasinii,* the latter a very uncommon plant in Fife. *P. veris* apparently occurs elsewhere on the same farm, often getting shaded out by growing plantations but then appearing again somewhere else not far away. The other parent, *P. vulgaris,* is common. It often flourishes on roadside banks, where also, in the sunnier places, occur *Knautia arvensis, Campanula rotundifolia, Sedum telephium* and *Pimpinella saxifraga* (scarce).

VERGES, HEDGES AND WALLS

The custom of cutting roadside verges to soil level - or below - at least twice a year certainly produces a late crop of dockens and umbellifers, and also provides soil for colonisation by field weeds, but it has nearly eliminated some species, such as *Linaria vulgaris.* However, before the first cutting, *Taraxacum officinale* and *Symphytum tuberosum* flower in abundance and, later, on wider verges, a variety of flowers produce colour, including *Silene dioica, Vicia cracca, Anthriscus sylvestris, Centaurea nigra, Ceum urbanum* and *Alliaria petiolata. Chaerophyllum temulentum* particularly favours this habitat; in contrast, only one of two known sites for *Agrimonia eupatoria* is by a roadside.

Some introduced plants thrive on verges. Among these are two comparatively recent incomers, *Cicerbita macrophylla* and *Phlomis russeliana (P. viscosa);* the latter, a yellow labiate from Syria, is of especial interest as it may not have been recorded 'wild' elsewhere in Scotland. Despite being partially cut each year on a shady bank near Coultra, where it must have been introduced 25-30 years ago, it is slowly spreading. Other wayside colonists are *Vinca minor, Tragopogon pratensis* and *Myrrhis odorata.*

Hedges are frequent and consist mainly of beech, hawthorn and occasionally blackthorn, and are clipped to various heights. In the north of the parish, around Balmerino itself, brambles and roses dominate road and track-sides, being especially colourful in autumn. Earlier, honeysuckle both brightens the hedgerows and scents the air.

Most field boundary dykes are mortared and some, near woods, are heavily mossed or overhung by conifers. Geranium *robertianum* is the most frequent plant in lighter places; *Asplenium* species are relatively infrequent. The recent modernisation of many old cottages and their garden walls has reduced the habitat available for *Cymbalaria muralis* and *Corydalis lutea,* only one colony of each having been found recently. The ruined walls of the Abbey are now consolidated too, and almost bare of plant life; *Parietaria judaica* and *Asplenium adiantum-nigrum* persist near the base. *Antirrhinum majus* grows on one old roof at the farm adjacent to the Abbey and nearby, *Chelidonium majus* can be glimpsed by the roadside.

OTHER UNCULTIVATED GROUND

Neglected land, open spaces, old quarries, former gardens, dumps and the like are quickly colonised by particular plants. The noxious weeds, thistles, dockens, nettle, ragwort and creeping buttercup soon become dominant in disturbed ground. Berwick would be very familiar with all of these but he would be astonished at the amount of *Chamerion angustifolium,* as it was not known here last century. A relative, *Epilobium ciliatum,* has also spread widely during the last twenty years into both dry and wet places. Bracken has probably increased since 1867 while whin continues to plague farmers.

Other species likely to be encountered in these habitats include common plants such as *Heracleum sphondylium, Sonchus olearaceus, Tussilago farfara, Rumex acetosa, Holcus lanatus,* etc., along with as yet uncommon incomers such as *Barbarea intermedia* and *Senecio viscosus.*

Small quarries, all disused, are widespread and usually are either shaded or used as farm dumps. Elder bushes and brambles do much to soften these eyesores. Other small agricultural tips are often quickly colonised by weeds and may sometimes produce an unusual casual, such as *Amsinckia micrantha.* Gardens too can have an odd casual, e.g. *Solanum nigrum,* while a few horticultural plants get out and may persist for a year or two, e.g. Linaria *purpurea.*

CULTIVATED LAND

Soils are light throughout the parish and are ideal for grain crops, while root and fodder crops are also grown. All the fields inspected contained at least some *Tripleurospermum inodorum* and some barley fields were badly infested by *Agrostis gigantea* and *Elymus repens.* Root crops contain *Aethusa cynapium, Galeopsis tetrahit,* a litle G. *speciosa* and often plentiful *Chenopodium album, Fumaria officinalis* and *F. muralis,* ssp. *boraei.* Crop species invade disturbed ground anywhere and sometimes persist, e.g., *Brassica napus* ssp. *oleifera* (rape) is increasingly found by roads and tracks, and ssp. *sativa* of *Daucus carota* is sometimes seen (carrot is widely cultivated).

In drier gateways *arePolygonum aviculare, Matricaria matricarioides* and *Veronica persica,* the two last plants being unknown as weeds in the 1860s. Damper places have *P. persicaria, Gnaphalium uliginosum* and occasionally *Odontites verna. Vicia hirsuta* seems to be scarce, though it is frequent or even common to the east of the parish. *Chrysanthemum segetum* has been found in only one field, and *Convolvulus arvensis* has not been seen at all; Veronica *agrestis* is frequent, and *Anagallis arvensis* occurs sporadically. *Chamomilla recutita,* uncommon in Fife, seems to be increasing along field borders and adjacent roadsides. All three of the commoner poppies are to be found, *Papaver dubium, P. rhoeas* and *P. argemone,* the last two rarely. Where rabbits destroy young grain crops,

Viola arvensis grows in abundance; it also carpets barley stubble in some fields. *Sonchus arvensis* and *Sinapis arvensis* are frequent in and by fields.

On one south-facing field margin is an established colony of *Echium vulgare* and nearby are *Anagallis arvensis* and *Stachys arvensis;* they are rare locally, *Anagallis* and *Echium* in particular needing a warm situation facing the sun. The very common weeds, e.g. *Stellaria media, Capsella bursa-pastoris* and *Lamium purpureum* occur in most fields and gardens, accompanied on the lighter soils by such species as *Euphorbia peplus, Fumarias, Urtica urens* and, rarely *Thlaspi arvense.*

CONCLUSION

In 1952 the *Third Statistical Account of Scotland* volume for Fife was published (Smith 1952), compiled from parish accounts written during 1946-49. From the short section on Balmerino and the descriptive article by Muir (1955), it is clear that in several respects the area had not changed a great deal since 1900. Farming was still the major industry but as yet far from being mechanised, many houses had no proper water supply, communications were poor, and there was a sense of isolation. The parish was still very rural with, as Muir put it, "all the charm of peace and seclusion".

Thirty years on, a marked change had taken place. Roads had improved whereas tracks and lanes had fallen into disuse; derelict buildings had been reconstructed and new housing, particularly in Gauldry, had been erected; agricultural practices had altered, notably in the use of fertilisers and sprays; hillsides had been reclaimed and many 'wild' corners brought into cultivation; new or replanted woodland, mostly coniferous, had appeared; road verges drastically tidied; and many more people, especially from Dundee, were paying visits - all to the detriment of wild life. Nevertheless, there is much to interest the field botanist (and naturalist) and there remains a feeling of peace and seclusion; a feeling which James Berwick too must have experienced as he "devoted much attention" to the flowers when going about his parochial rounds all these years ago.

ACKNOWLEDGEMENTS

Mary Benstead did much of the field work and without her assistance and notes this paper could not have been compiled; indeed, she wrote some of the original text. For ready access to their property, thanks are due to various land-owners, particularly the Earl of Dundee (Birkhill) and Captain J. H. and Dr Crawford (Naughton). Douglas McKean of the Royal Botanic Garden helped with some nomenclature and distribution details. As ever, the resources of the Signet and Royal Botanic Garden Libraries in Edinburgh proved invaluable.

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NOTE

As a full list of species would occupy too much space, a Biological Records Centre species card has been completed and a photocopy made of Berwick's 1867 list. Along with an offprint of the above paper, these have been placed in the Library of the Royal Botanic Garden Edinburgh where they should be available for consultation. G.H.B.

IN SEARCH OF THE BUCHANAN FERN III

John Mitchell

It is particularly appropriate that 1991 - the centenary year of the British Pteridological Society -- should be marked by the discovery of a remarkable display of *Athyrium filix-femina 'Victoriae'* or Buchanan Fern at Brodick Castle on the Isle of Arran, former country seat of the Dukes of Hamilton. 'Discovery' is perhaps not the right word, for this eye-catching variety of Lady Fern has been in full public view for well over 30 years since the castle and its gardens were gifted to the National Trust for Scotland in 1958.

On reflection, it is surprising that it took me quite so long to think of seeking *A.f.f. 'Victoriae'* on this picturesque island in the Firth of Clyde, for there is a direct family link between the Hamiltons of Brodick and the Montroses of Buchanan in West Stirlingshire, where this unique fern variation was found in 1861 and for many years proudly exhibited in the castle gardens. In 1906 Lady Mary Louise, only child of the 12th Duke of Hamilton, married James Graham, eldest son and heir to the 5th Duke of Montrose, the newly weds choosing Arran as their summer home. In greatly extending the now world-famous gardens at Brodick Castle, Lady Mary Louise undoubtedly transferred a number of choice plants from their winter retreat at Buchanan, including, it would seem, a portion of root-stock from the original *A.f.f. 'Victoriae'*.

Brodick Castle's finest show of *A.f.f. 'Victoriae'*, which covers up to two square metres within the walled garden, comprises a dozen or so multi-crowned stocks (photo opposite). Like the Boquhan example turned-up in 1984, the fronds when fully unfurled reach 115cm or more in height and show all the desired features of the type variety, including the division of the pinnae (side branches) being extended into the pinnules (branchlets). The fern's striking appearance together with its impeccable lineage suggests there is every chance that these specimens are identical to the 'original' so admired by the leading authority on fern varieties C. T. Druery when he visited the gardens at Buchanan Castle almost 100 years ago.

In completing the trilogy of my ten-year search for the Buchanan Fern, my thanks go to the gardening staff and ranger service at Brodick Castle and Country Park for drawing my attention to the royal presence of this quite magnificent 'Queen amongst Lady Ferns' in their care.

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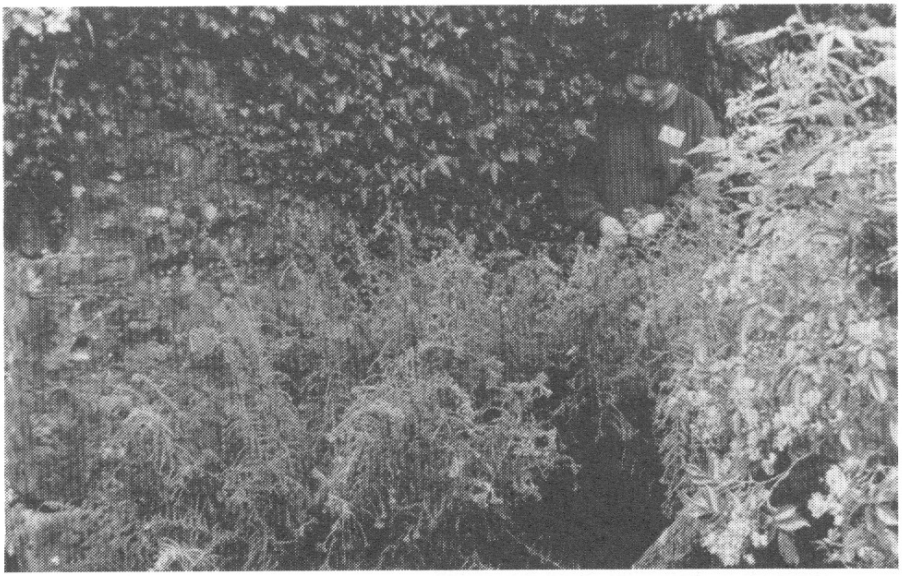

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BOOK REVIEWS

REMINISCENCES OF DOLLAR AND TILLICOULTRY. G. W. Gibson. Second Edition (1881) reprint. Strong Oak Press. 1990. 239pp. ISBN 1-871048-18-4. £15.00.

We are indebted to the Strong Oak Press of Stevenage in Hertfordshire for their decision to do this reprint. First published in the 1880s — a time of Victorian self-discovery as a result of social and educational developments — the book is an honest attempt by a wool manufacturer of the period to place into some perspective the divergent histories of the Hillfoots villages and their surrounding areas.

As a source of reference, the reminiscences are not always reliable. The Dollar section, for instance, is a thinly-veiled account of Gibson's own genealogy and life, complete with dreadful poetry. His (establishment) view of events surrounding the founding and progress of Dollar Academy, to take one important example, is of limited value. I suspect he did not want to offend his neighbours!

When he moves to Tillicoultry, however, he is plainly dealing with a subject — the development of the woollen trade in the town — for which he has knowledgeable enthusiasm and his work in this area encouraged me to re-visit the Mill Heritage Centre in Tillicoultry where much of his research is displayed more accessibly.

There are many interesting asides in this book such as the detail on the introduction of gas, electricity, railways, postage, telephones, etc., to the district and a proliferation of lists — teachers, bankers, ministers, classmates and so forth — all of which probably contributed to his initial sale and which still add to the interest of the general reader or local researcher with ties in Clackmannanshire and other districts adjoining the Ochils.

Jim Wilkie

AN ENVIRONMENTAL ATLAS OF SCOTTISH FRESH WATERS.

Wallchart full colour Al, and teachers notes 20pp. by Scottish Conservation Projects in conjunction with the Nature Conservancy Council for SCP's Operation Brightwater campaign. £3.95 (p & p 50p) from Scottish Conservation Projects Trust, Stirling, FREEPOST, FK8 2BR. Through a series of pictures and maps this educational promotion explores the origins and variety of Scottish fresh waters, the impacts of forestry, hydro electricity and acidification, and the life history of some important species and threats to their survival.

THE SCOTTISH ENCLOSURES NEW FARMING AND A NEW LANDSCAPE IN THE 18th CENTURY A LOCAL FARMER'S VIEW

Lewis Stewart

Lewis Stewart died suddenly in April 1991 at the age of 54. With the kind consent of Sarah, his widow, we now publish this article which itself speaks volumes for his love of the countryside around Stirling, for his perception of the changing scene in agriculture, and for his burning desire to communicate - particularly to the next generation.

Lewis was long a champion of the family farm, and maintained that when mankind has selfishly plundered all the earth's resources, it will be the family farm which will again become the pattern of subsistence. He was fascinated with the forces which formed his family holding, and loved to speculate on the happenings which had throughout history unfolded across the farm which we know as Dunaverig. He gathered together evidence from distant and recent past, and welcomed visitors old and young to learn the country skills and to share his enthusiastic presentations within his farm-museum. Hospitality often included a delicious plateful of home-grown strawberries or raspberries.

He tried long and hard to draw the attention of legislators to the defects of our agricultural system, and pointed knowledgably to the improved approaches of the Scandinavian countries which he had studied on an Arkleston Fellowship. He was a frequent broadcaster on the problems of the small farmer, and he became a living legend for the ingenious ways in which he drew attention to the inconsistencies of the bureaucrats. Behind the ironic humour there was always a deep concern - for Scotland, for future generations, and above all for the 120 acres of which he truly felt himself a steward.

We would wish here to offer to Sarah and to their family our sincerest sympathy. Readers who wish to identify themselves with the principles for which Lewis stood, and who would like to support educational projects which Lewis himself would have encouraged, are invited to send financial contributions to: - "The Lewis Stewart Memorial Fund", c/o Dunaverig Farm, Ruskie, Thornhill by Stirling, FK8 3QW.

K.J.H. Mackay

The five Enclosure Acts passed by the Scottish parliament between 1661 and 1695 stimulated a great transformation in the countryside, which in turn provided the manpower for the industrial revolution. Once the enclosure procedure had been applied it was - according to one observer "as if a magic wand had been passed over the land". Such acts were badly needed for the old run-rig system had hung on too long, putting us far behind others in Europe. Visitors to pre-enclosure Scotland were always reporting about vast stretches of bog and wet lands, wild

mountain areas and a treeless landscape. Agriculture, they said, was non-existent. The hovels which wretched folks suffered for homes were described as smoking dung heaps, and the state of roads never failed to receive adverse comment. The lack of bridges forced exhausted travellers to ford burns and rivers. Worst of all, they saw the inhabitants of this untamed land as full of sloth, ignorance and poverty . . . our ancestors!

1661: ACT FOR PLANTING AND INCLOSING OF GROUND

We should be careful about condemning our ancestors. Previous attempts at land improvement had been made, but had not been successful. Eventually, Charles II with the consent and advice of his Estates of Parliament declared that-

> "All heritors, life-renters and wadsetters with property worth one thousand pounds (Scots) of yearly valued rent, should enclose four acres of land yearly at least, and plant about with trees of oak, elm, plane, beech and other timber at three-yard intervals".

Smaller holdings were expected to do the same, but on fewer acres. Ditching was also recommended, together with the right to cast about (re-route) highways provided they were not removed about two hundred ells (c 200m) upon their whole ground. Severe forms of statutory punishment were listed for those persons, or their stock, should they damage the ditched, enclosed or planted land. His Majesty finished off by declaring that -

"such persons who followed these instructions shall be encouraged by their ground being free of all land taxation, impositions and quartering of horse for nineteen years". This was the classic carrot and stick method, with a very attractive "carrot" which really set things on a new course. Within eight years, another two Acts were passed, one dealing with disputed boundaries between enclosed lands, and the other covering roads.

1669: ACT ANENT INCLOSEING OF GROUND

Some enclosures were unable to proceed because of disputes over irregular boundaries which made it difficult to build the enclosing dykes in straight lines. This Act laid down that either party could call on Law Officers to visit the disputed march, and to lay down for all time coming, a common march "so as may be least to the prejudice of either party", though compensation could be allocated if one party was considered to be disadvantaged by the new boundary.

1669: ACT ANENT FENCING AND REPAIR OF ROADS

These proceedings required that a road passing through land on which crops were growing had to be fenced. Further it made the Sheriffs and Justices of the Peace in the various counties responsible for the upkeep of the roads by introducing a scheme of statute labour. Every man in the

parish between the ages of 15 and 70 had to give six days labour (darg) on the roads every year. Reluctance to do this work was so general that from 1751 the scheme was superceded by the Turnpike system, whereby Road Trustees used their tolls in part to employ surfacemen, dykers and bridge-builders.

The Toll system improved the situation enormously, providing us with a wonderful heritage of attractive toll cottages, roads, dykes, bridges and mile posts.

1686: ACT FOR WINTER HERDING

The necessity for this Act really highlighted the situation prior to enclosing. It stipulated that all heritors, life-renters, tenants, cotters and all possessors of houses and lands, must herd their horses, cattle, sheep, swine and goats the whole year, winter and summer. At night-time they had to keep the same in houses, folds or enclosures. Heavy fines were recommended for straying life-stock doing damage. This Act helped to speed up the process of enclosure. These had been lean years for crops, and waste through damage could not be tolerated. The term 'farm close' - for the enclosed area at the back of a farm - dates back to this period. While the first four Acts might have had a fair degree of general support, the fifth and final Act caused great bitterness among the common people.

1695: ACT ANENT LANDS LYING IN RUNRIG

This enabled and encouraged contiguous heritors to enclose any further COMMON LAND which was still being allocated by the old (run-rig) system. It invited owners to apply for a System of Division through the Sheriffs, Stewarts, Lords of Regality or Justices of Peace of the Shires, where the lands lay. Like the first Act, this caused many evictions. Large acreages of common lands were taken by landowners, some by corrupt methods. A Burgh like Callander lost all of its 2206 acres of commonty, and the Parish of Comrie its 5058 acres. Preference in division was ordered to be given to the Mansion Houses and their Estates.

CHANGES IN THE PATTERN OF LAND OWNERSHIP

In Scotland land was never confiscated by the Crown. The Royal Charters given to feudal barons were not ownership in soil, but only guarantees of military and judicial superiority, with the right to take fixed feu rents and privileges. The old patriarchal authority was only destroyed when a minor Act in 1597 demanded that chiefs and lairds should produce titles to the soil. Needless to say one or two may have hired doubtful lawyers who were willing to draw up documents entirely to their client's advantage. That seems to have been the way that some land rights were seized

Meanwhile many of the 'natives' were so oppressed with heavy service duties, feus in kind, and threats of pit and gallows that they hardly bothered to farm or work beyond the minimum . . . . an appalling situation!

The Enclosing Acts greatly changed the attitude shown by the land-owning barons, persuading them that estate development might be more beneficial than reiving and warring. The barons realised that overlording could become 'financial'; this money income would allow them to travel, to establish town-houses in London or Edinburgh, and to follow a different life-style. One cannot help but wish that, for Scotland's sake, King Haakon had won the Battle of Largs back in 1268. Moderate udalism (alludium) would have flourished with NO superior landowners. However, money rents and the abolition of heritable jurisdiction in 1748 did much to set the stage for a great dawn and new awakening.

EFFECT ON THE COUNTRY POPULATION

Unfortunately progress rarely evolves without protest and suffering. The communal run-rig system involved 90% of the population. Five or six families were deprived of their land for each communal run-rig holding or 'ploughgate' which was enclosed, improved and let to a single tenant. The wonder is that so few riots ensued. One reason may be that many families were rehoused in estate cottages, and employed as farm-workers or tradesmen, earning a monetary wage.

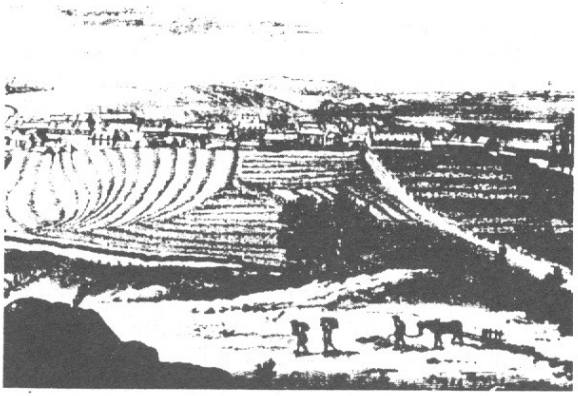

Figure 1 Landscape of unfenced fields near Arbroath, farmhands and horse and sled
Slezer 1692

Only one major uprising features in the Scottish history books, and that was the Levellers' Revolt of 1724 in Dumfries and Galloway. Demolitions of enclosures went on by night for at least six months.

Many folk left the old rig-touns voluntarily, attracted by village or town life, a full-time occupation, and a new form of freedom. As enclosure progressed, the drift from the land accelerated. Incorporated trades like masons, baxters, weavers, hammermen and so forth flourished with the 'progressive farming' and the developing industrial revolution. Thus there was a surge of enlightenment, and a new landscape, but not so much freedom, perhaps, as was first thought.

EFFECTS ON FARMING METHODS

In the countryside the change was gradual. Working horses took the place of lumbering oxen. An ox-team with plough would have been thirty-five yards long; huge headlands were laid waste because they needed so much room to turn. The new horse-pairs worked the fields in short rigs and tilled right up to the headland, a move itself which must have given the rural areas a sense of discipline. But the horses did require more expensive feed, which meant they consumed much of the farm profit. Nevertheless the horse pairs did reign supreme until the 20th century 'iron horse' came along.

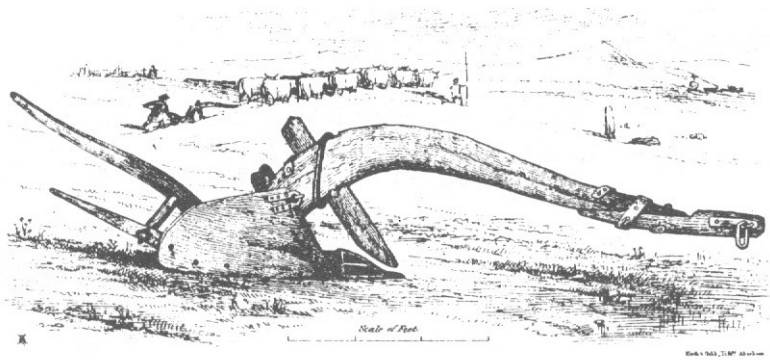

Figure 2

Twelve oxen plough of 18th century

Many of the reforming lairds joined the Honorable Society of Agricultural Improvers, taking part in great discussions concerning the art of agriculture estate management. Often they first put these ideas into practice on the Home Farm or the Mains. As well as enclosing, ditching and tree-planting, the improvements sought to provide a well-planned steading with a complementary field system, which would be let on a long lease to a single tenant. The expectation of high money rents as well as tax concessions encouraged the lairds to complete the enclosure of their estates.

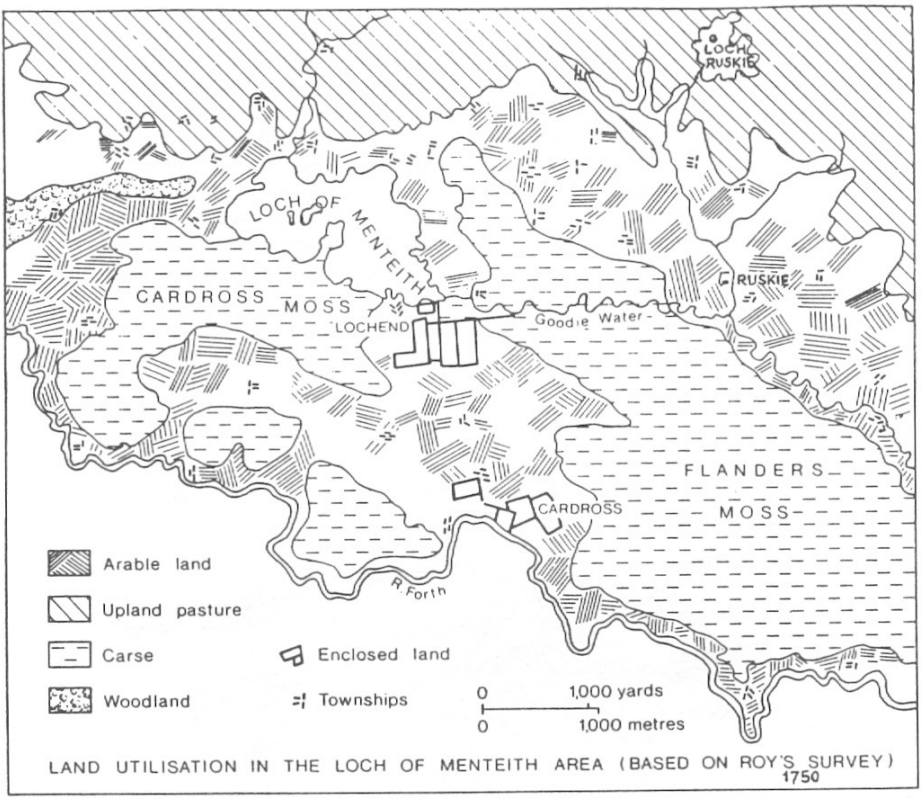

Figure 3 Land utilisation, Loch of Menteith area, c. 1750

Many skilled tradesmen were hired to speed the work. Maps exist which show the situation prior to improving, the work partially completed, and the full complement of the new 'touns' (e.g. figures 1, 3, 4). Some Estate records give very detailed accounts. The first Statistical Account (1795) for Menteith states that most of the initial enclosing had by then been carried out, with a considerable population decline. Competition for the new farm tenancies was so fierce that rents often rose rapidly, and many 'guidmen', including Rabbie Burns himself, were bankrupted under the pressures of the new economic climate.

THE ENCLOSED FARM

Economics are one thing; at least the improved farms must have been something excellent to see, especially the Mains farm. Typical of the pioneering improvers was Lord Belhaven, who published detailed specifications for every aspect of farm operation. (Our farm, Dunaverig, in Port of Menteith parish, was drawn up on the Belhaven layout.) Specially qualified surveyors, called plankers, usually supervised the work. They just went in and demolished the old rig-touns and recycled some materials, often leaving only the toun names, the wells and the road system as a vestige today.

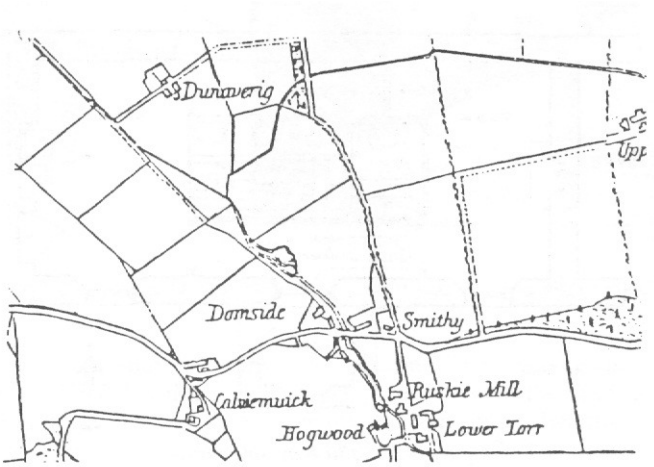

Figure 4 Ruskie and Dunaverig area, post enclosure, later 1700s

The first consideration for a new farm would be its size. If about forty acres were available, it would be a one horse pair toun, increasing proportionately in land and pairs of horse up to ten or more pairs on one farm. The touns generally became larger as one travelled east, and this was also the direction the tenants moved as they prospered. Where a rig-toun

was divided into two farms, they usually put either Easter and Wester, or Lower and Upper, in front of the old name. Other kinds of division called for further names - Middle, Little, Nether, Over, Thirds or Newton.

BUILDING THE NEW FARMS

Usually the steading was built in the middle of the lands allocated. A high standard of design and workmanship was achieved. A master-builder would be in charge, his first task being to open a local quarry, and to employ masons and carters. The wage rates were very attractive, so competition for employment maintained the standard without much bother . . . a very subtle situation.

An improved form of the 'but-and-ben' farmhouse would be built, most likely facing south, with the proper complement of buildings (barn, byre, stable, etc.) sited round the back-close in a square. Often the midden was in the middle of that close (see figure 6). Dressed local stone would be used to finish the random rubble walls; the more expensive the finish, the higher the rent! Joiners would do their work, probably using imported timber, although occasionally it was the laird's wood. The roofing was likely to be thatch because slate or pantile was still scarce. It is ironic to think that we are only now getting back to the insulation efficiency of 'thack' all these years later.

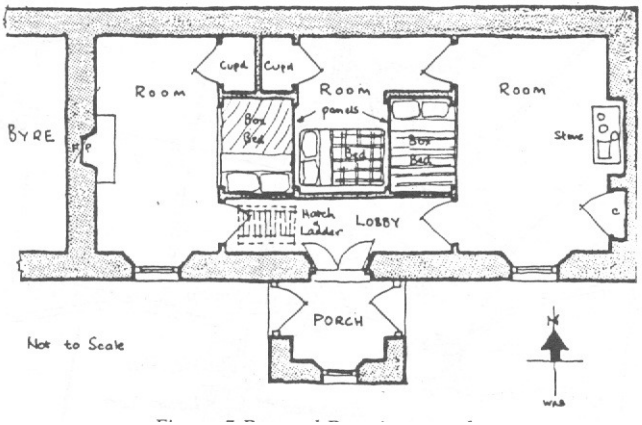

Figure 5 But-and-Ben, improved

One cannot help but comment on the old but-and-ben, the two-roomed single-storey cottage with a history. The 'ben' end (inner room) was slightly superior in finish because the farmer and his guidwife, with the youngest children, occupied this room. The 'but' end was the living-room/kitchen for the family, fitted with a box-bed opposite the range for the daughters and dairy-maid. The farmer's sons slept in the attic above, or above the stable. There were endless refinements like the quality of the window shutters,

the fitting of snecks or locks, and the efficiency of the kitchen range. The peat-fire was never allowed to go out, except when folk were evicted.

As a general rule, the new barn sat north to south on the west side of the close. It contained a flail floor and a granary, with doors west to east for winowing the grain. It was not until the turn of the 19th century that proper threshing-mills and horse-engine houses were widely installed. When visiting a farm, it is often possible to judge its original size from the number of cart sheds of the barn. One cart shed, one pair of horse - that was the story of our farm. From time to time, the barns of the new touns were used informally by travelling entertainers who were always popular for a barnstorming session.

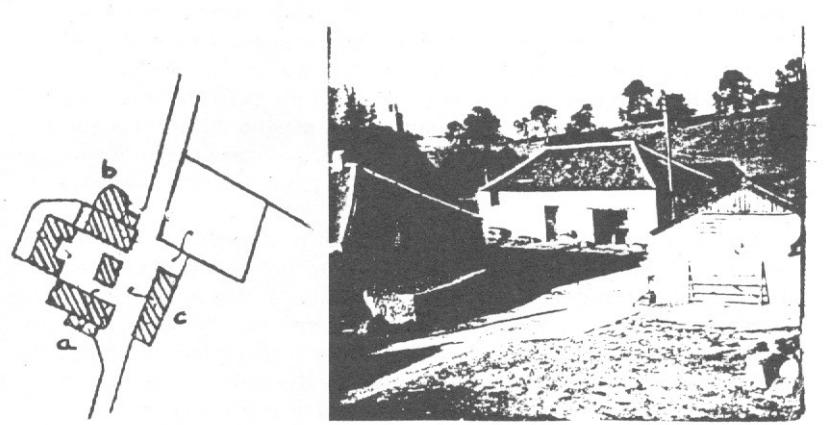

Figure 6 Dunaverig farm close 1850s - barn (a), cart and horse shed (b), byre (c): farmhouse on left

The byre was another sophisticated building. The cows made it a warm place in winter. For this reason it was often joined to the farmhouse by a partall door. One can think of many modern central-heating systems more expensive than this! The number of stalls reflected the stock rate of the farm; people's wealth was judged by the number of cows they owned. Women sang beautiful songs while milking the cows - romantic milking parlour!

On the side of the close opposite the house was that essential building, the stable. The number of stalls depended on the number of horses, which in turn depended on the farm size. Once again the finish of the workmanship reflected the prosperity of the estate. The horses were so important to this new farming system that no stable, no fodder, and no handler was too

good for them. Horse teams were a very expensive item in the farm budget, since experienced men had to be hired to make best use of them, saleable grain had to be held back to feed them, and implements had to be constantly maintained and repaired. Perhaps this was when farmers started complaining about life being 'a sair fecht'! The rest of the steading varied from farm to farm. Most would have a stackyard, kailyard, front garden, porch, milk-house, bothy, midden and outside toilet, with maybe a scullery, piggery and other items as well. Little wonder there was great competition for these farms. The Rev. James Robertson of Callander, writing in the second Statistical Account (1845), said "Few farms were wanting for such as glass (in windows), and most had two storeys".

THE ENCLOSED FIELD SYSTEM

Having a field system for each farm helped to evolve rotational husbandry; animals could graze in one field while crops grew in the next. This was the great breakthrough. It ended the sheiling/summer-grazing system. Rotations worked closely with nature. In this district, four-to six-acre fields were a convenient size for cropping. The famous 'sair six' rotation was a succession of ley oats, roots, mashlum (mixed beans and oats), oats undersown, grass and grass again. These crops must have looked well with the drystone walls around, and the small woods here and there.

If field or quarried stone was available, it was generally used for the enclosing boundaries, instead of hedges or turf dykes, Estate records have details of men being hired to hand-dig, or delve, the new fields to remove stones and boulders. Boulders were a great problem for many had to be blasted with powder. The stones were carted or 'slyped' to the line of the boundary and built into the dyke. This might require a ton of stone to the yard, so a typical square four-acre field could consume 600 tons of stone . . . hence the term 'consumption dykes'.

The plankers (surveyors) knew that straight dykes were more easily built, so the new fields tended to be square, with straight walls. In certain areas, superstition died slowly, and some farmers tried to find a wee corner, or point, in the new fields to leave some of the crop for 'Auld Nick', so as to ensure a good harvest for the next year.

Such was the stimulus to rent fields that one estate built fifty miles of dyke is seven years. Modern-day satellite photographs of the enclosures are most spectacular.

Ditching was another clever process. Sub-surface drainage did not come along for another century, so fields were still ridged. Under horse ploughing, the crowns were not so high, and the baulks less rough than they had been under ox-ploughing. Ditches and burns caught the surface run-off water, giving watering-points at the same time. Many areas of bog and wetland were drained with ditches. Some channels had to be hewn out of surface rock.

The trenchers, like the dykers, were probably local, estate rates of pay were

quite good, and in those days men had to find work to survive. This fostered a strong tradesman-like approach to work, an individual finish and a great appearance of permanence.

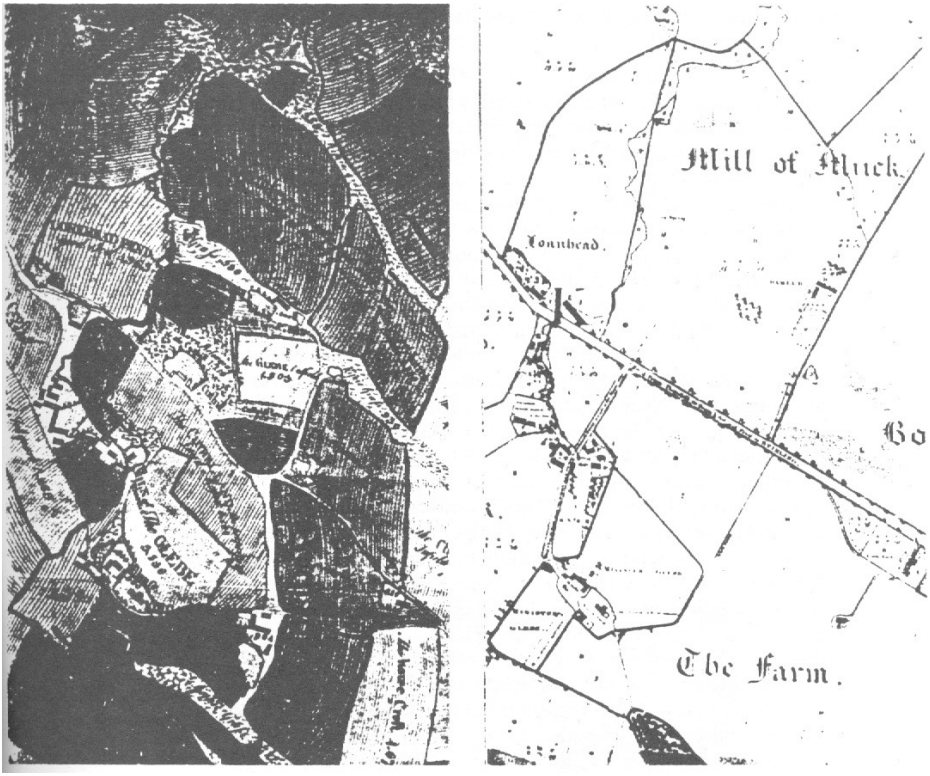

Figure 7

Blairdrummond Estate plans - (left) 1754, by T. Winter, (right) 1800 by Kyle. Before enclosure, numerous small, irregular fields, scattered cottaries, water mill, kirk and manse characterise the pattern of land utilisation. After enclosure, the village of Orcharhead has been replaced by large regular fields, narrow winding byways are replaced by fine straight wide highways. Some of the cottages have been preserved; two rows of farm cottages have taken the place of others. Church manse and mill can still be identified.

TREE PLANTING

The Enclosure Acts mentioned planting trees at three-yard intervals. Most legislation includes errors. This must have been one. Trees at three-yard intervals along a boundary would be too close, and not practical, so the tax officials settled for strips, squares or rounds of trees for the exemption. This is why so many roundels of trees, each with a neat surrounding dry-stane dyke, can be seen today. Unfortunately they tend to get in the way of modern agricultural methods and are often removed. If only we could have some present day Enclosure Acts which could be equally successful as those of the 17th Century.

OTHER ESTATE IMPROVEMENTS

Enclosing introduced many features worthy of note, but having a less direct connection with farming. Smiddies flourished for shoeing the horses, mending implements, ringing cartwheels, making gates and maybe wrought iron for the big house. By now the laird would be dwelling in a classically styled mansion, leaving the old fortified castle to collapse in decay. 'Parking' was a word used for the provision of more exclusive, landscaped enclosures around the mansion. Often the laird would build a threshing-mill down by the burn, opposite the old meal-mill - to which the tenants would still be thirled. The miller's cottage would be rebuilt at the same time just to improve the rent.

Schools and school-houses were built, as well as toll and surfacemen's cottages. Most rural cottages had an attached byre, with ground for crops and for grazing. Near the old fording places, beautiful new bridges were built. The inns which provided refreshment and lodging for travellers often had a face-lift too. When estate finances were available, cottages for estate workers were upgraded or rebuilt.

As a responsibility of the Parish heritors, the kirk, kirkyard, manse and glebe were also improved. Within the new 'moneyed economy', the minister's stipend reflected more than the general level of prosperity. A farmer can only wonder at the skill which went into building most of the Churches of this period. The graveyards and gravestones were treated with loving care. (One canny laird, on receiving a proposal from the local church elders that a new graveyard wall should be built, is supposed to have replied "I NEVER bigg (build) dykes till the tenants complain!") The master-masons put up manses, walled gardens, enclosed glebes and provided us with a heritage virtually unequalled. Nature always has been an exacting task-master; mortality was never far from folk's thoughts. Undoubtedly the kirk filled a need in the hearts of country folk.

A THREAD OF CONTINUING TRADITION

Perhaps the most glamorous feature of this new landscape was the continuity in the work of the cattle drover. The drovers brought cattle from West and North to the 'trysts' in the lowland market towns, the principal one being at Falkirk. Often their route followed the old ways because of the

softer going, better grazing, and the absence of tolls. In places, long lines of parallel dry-stane dykes some ten yards apart are silent witnesses to these old routes. Resting stances on the drove-roads occurred about every ten miles, and these can sometimes be traced still. Such things as the Herding Acts meant little to the drovers, impounding or no impounding.

Along with the cattle trade was the lucrative trade of exporting hides. The keen observer can still pick out traces of the old managed woodlands which produced oak-bark for tanning.

SUMMARY

To summarise, Scotland always had great potential for feeding her growing population, yet it was due to relatively minor Acts of Parliament that the great surge forwards occurred in Scottish agriculture. Old feudalism was transformed into modern, 'enlightened' feudalism. Those who wrought the transformation used natural materials to stamp the countryside with a look of great balance and harmony.

By the middle of the 19th century, the Scottish ferm-touns were the envy of Europe. Scottish pioneers in farming and in industry were making themselves known and respected throughout the world. Back at home villages and towns conveyed a pride in their heritage and the established order. Roads were metalled and fenced. Generally the state of the common people had greatly improved, although many problems were still to be resolved. Earlier visitors, like Daniel Defoe, who had been so critical, would have found all this hard to believe.

However, a word of warning has to be sounded about our unique enclosure landscape, in the light of modern production methods. The standardised synthetic approach could easily sweep aside our heritage.

Figure 8 Broken dyke and wire fencing

For example, attractive grants are given for fencing with wire, while too often walls and dykes remain neglected, at a time when we have many unemployed. Hybrid conifers can be planted in huge monotonous blocks, with Government aid, yet these can destroy the individuality of strath

and glen. Monoculture and agribusiness are bidding fair to oust self-sufficient rotational husbandry and the family farm structure. Pollution and disfigurement of the landscape create ever-increasing problems. We now have higher standards of education and much sophisticated planning, but if we do not find some new 'Enclosure Acts', the 20th century wand may prove not to be so magic as we are led to believe . . . .

Note - "Since Lewis wrote this there is now good grant aid for dykes, and farmers are encouraged to plant mixed hardwoods and conifers; maybe things are looking up" - Sarah Stewart.

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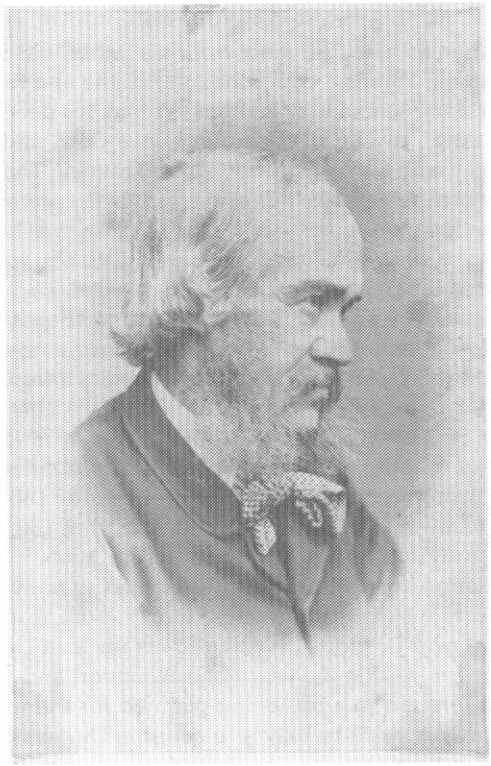
PEOPLE OF THE FORTH (5) THOMAS STUART SMITH

Susan Jamieson and Evelyn Paton

This article is based on an exhibition at the Smith Art Gallery and Museum during 1989 to recall something of the life and work of T. S. Smith (1815-69), artist and founder of Stirling's Gallery/Museum, and to mark the achievement of its recent renovations. "This fine institution, the noble bequest of the late Mr Thomas Smith of Glassingall, Perthshire, was opened yesterday in the presence of a distinguished company of ladies and gentlemen". *Glasgow News, 12* August 1874.

T. S. Smith had died suddenly in France some three years earlier. He had spent only six living at Glassingallnear Dunblane, an estate he had with great difficulty succeeded in inheriting, then left it to practice art and to travel around the UK and Europe; yet had left enough money to build Stirling's first art gallery/museum and public library.



THE EARLY YEARS 1815-38

Family

We still do not know where — or precisely when — Thomas Stuart Smith was born. His father (also Thomas Smith) had inherited - jointly with his brother Alexander - the estate of Glassingall from their uncle Alexander Jaffray. Thomas Smith senior fell into financial difficulties whilst trading as a merchant in Greenock and sold his share in the estate to his brother Alexander. Of his mother, Thomas could, in later years, remember little:

> *"I was far too young when she died and being constantly at school, had seen far too little of her to recollect her now".*
>
> *Thomas to Alexander Smith - 27 June 1836*

While based in London, Thomas' father seems to have spent most of his time overseas, and at the age of 11 Thomas was sent to the boarding school of a M. Montennis in Bourbourg in Northern France. Although the father seems only to have paid his school fees for the first year, they appear to have kept in touch and remained attached to each other even though his father was working mostly in Canada and the West Indies.

Friends

After 1831 Thomas heard no more from his father. His schoolmaster agreed to complete Thomas' education, and clothe and feed him, if he would stay on at the school long enough to repay his debts by teaching as a 'junior master'. By late 1835 his debts were clear, and he travelled to London to stay with a school-friend — John Trimnell. There he learned of his father's probable death, but also of the existence of an uncle -his father's brother Alexander - in Scotland. However he also learnt, some months later, and with considerable shock, that he was illegitimate - his father and his mother had not been married. Alexander Smith was equally thrown to learn of Thomas' existence -*"I have had a communication from a young man who claims a very near relation to (my brother). Do you* know *anything of him, if so, will you inform me of what you* know?'

Alexander Smith to Frederick Wedder, 5 July 1836 (SRO E853/5).

With the help of friends, Thomas established communication with the uncle who in September sent to one of these friends £30 for Thomas. In March the following year Alexander sent another £30. By this time Smith had already left London for France and soon found "a very handsome situation in a distinguished nobleman's family", as tutor to 16-year-old Henri - younger son of the family, with whom he stayed in their chateau near Grenoble. Writing to his uncle in December 1837 he thanked him for making the year "one of comfort and consolation", and he looked forward to a trip being planned for the following year - to accompany his pupil to Italy - a country Thomas had talked of visiting for some time.

ITALY 1838-49

"At last, at last, I am in Italy"

In the early parts of 1838, Thomas travelled with the de Meffrays from Grenoble to Marseilles, mostly on foot, and from there by steamer to Naples. He lived with the family in a house just outside Naples, earning a salary of £200 per year. In a long letter to his friend John Trimnell that year he paints a picture of a grand, comfortable life - musical evenings, visits to the concerts and opera in Naples, lessons in the flute, and travels in the Italian countryside. Three days every week were his own, and by April he had found "my heart's object, a master - Marsigli, the first painter here and one of the first in Italy".

He appears to have stayed with the de Meffrays for nearly two years, but by September 1839 he was living on his own, and accepting his uncle's financial assistance, which until then he had refused. For the next year he lived at the Monte Verginella monastery in Naples continuing seriously his studies in art. He drew fairly regularly on the assistance of his uncle, to whom he sent sketches, asking him for his opinion both on these and on the course of his career. In September 1840 Thomas completed what he describes as "my first attempt at landscape and my first oil picture". He cut it in two with his palette knife, but his painting master persuaded him to put it together again and complete it. He sent it to his uncle, and described it at length in a letter to his friend Trimnell. A sketch for this work was found recently in the Smith.

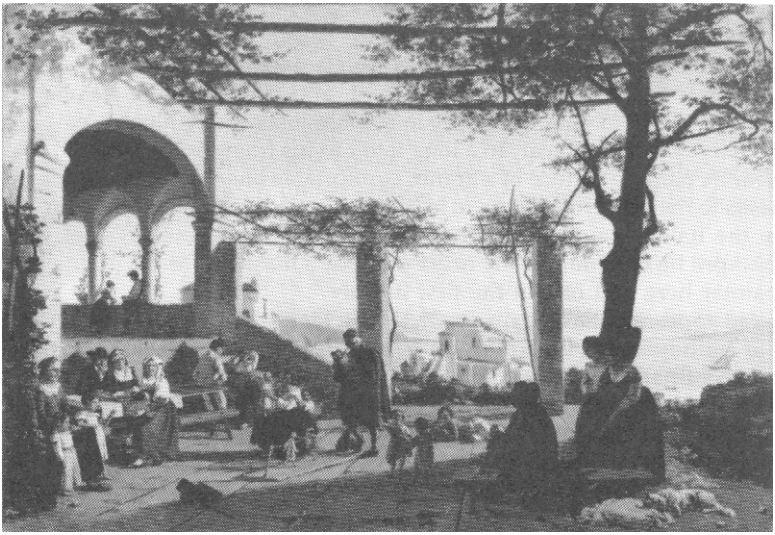
Venice, Rome, Sicily

By September 1840, Smith had received a total of £95 from his uncle, and he felt able to afford a three-month trip to Sicily and back through Southern Italy. In May the following year he wrote to ask for an allowance of £25 or £30 a quarter, commenting-

"You kindly ask me how long I think of remaining in these parts. Were I sufficiently advanced in my art I should not be here a day longer but begin my fortunes in Paris or London".

Two years later his uncle was asking whether Smith's demands for bank drafts of regularly more than £30 were not 'a step beyond' their original agreement, and accusing him of spending too much money on his friends. Dogged by continued ill-health, Smith remained dissatisfied with his progress as an artist, and his inability to sell much of his work. He travelled throughout Italy as much as he could afford, frequently spending winters in Rome where he hoped to sell paintings to visiting tourists.

Perhaps confused by Smith's continuing doubts about his ability to earn a livelihood by his art, his uncle never refused a request for money, politely accepting pictures sent to Scotland but unable to offer much advice on what line he should take, other than suggest that he try portraits



An Italian evening scene T,G. Smith

An End to Italy

In response to his uncle's mounting concern on the continued drain on his finances, Thomas wrote, in December 1848 -

> *"If I could sell* a *couple of pictures and thereby raise from £60-£100, I would return* to *England where I feel persuaded I should get* on *and do well".*

In May 1849 he was in Paris bringing pictures for the 'London Exhibition', which he had been unable to send from Rome. For more than a year Italy had been, like much of Europe, in political turmoil, and his letters had recorded an increasingly dangerous country to live in. He was successful in exhibiting three paintings at the Royal Academy Exhibition in London that year, and four at the Salon des Beaux Arts in Paris. But in Paris he heard that the uncle whom he had never met had died. He left no children, no will, and the estate at GlassingalI had been taken over by the Crown. Thomas' main source of income had come to an end. He travelled to London to stay with his friend John Trimnell.

IN THE WILDNERNESS 1849-56

Eighteen different people, as well as Thomas Stuart Smith, made claim to Alexander Smith's estate. Due to his illegitimacy, Thomas' main difficulty was in proving that he was Alexander's nephew, and therefore closest surviving relation. He began to build his case with the help of John Trimnell, and friends of his father who had supported him all through his life. The case was not heard until November 1855. During this time little is known of what Thomas did, other than the work to prove

his claim. For some time he lived in Nottingham, earning money by painting portraits and giving lessons. One of his pupils was the photographer, picture framer and art materials supplier Alfred Wilson Cox, who was to remain a friend for life. He kept in touch by letter with his artist friends in Italy. While it is doubtful that he could have afforded to visit the country, he may have completed paintings in England, based on sketches brought back from Italy.

In February 1856 Thomas heard that his case had been sustained, and that he would receive most of his uncle's estate. Legal formalities were not completed until September, after which he seems to have returned to Rome for some months. In late January 1857 he was in Scotland, and perhaps it was then that he first took up residence at Glassingall.

THE LAIRD OF GLASSINGALL 1857-63

Glassingall was an estate of some 650 acres, to the north of Dunblane. Alexander's house in Stirling was given to one of the other claimants, and smaller farms in the area of Conglour, to the south of Stirling, were sold early on to pay Crown dues and the legal bills incurred over the last seven years. Most of the estate was rented to tenants - with one of whom Thomas had a continual battle for the next five years. Much of the management of the estate was done by a factor, and by Thomas' solicitor Mr Barty in Dunblane, while Thomas himself seems to have found estate matters trying, frequently dissatisfied with not having things done exactly the way he wanted, and not good at getting on with the Scottish tradesman or farmer. Although he must have known no-one at first, he dined occasionally at large nouses on neighbouring estates, but remained lonely at Glassingall, constantly appealing for friends to come and stay. In August 1863 negotiatins for the sale of the estate were completed and Mr Henderson of Edinburgh became the new owner for the sum of £18,500.

THE PROSPEROUS MAN 1863-69

London and Abroad

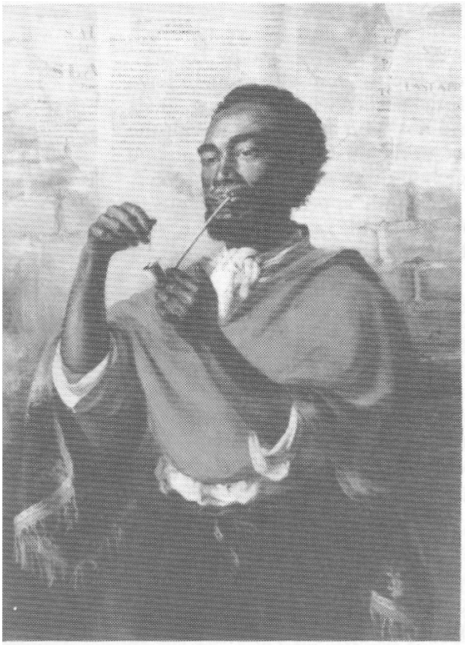
Smith lived in the Bedford Hotel in London until he found rooms and a studio to rent - at 35 Fitzroy Square in 1866. John Pettie and William Orchardson were amongst other artists also then living in the same area. He now began to build his own art collection in earnest, buying from a wide range of contemporary British and Continental artists. His bank account books also show that he frequently supported young artists with gifts of money.

Looking on the period at Glassingall as wasted years, he "regained some practice by study from nature (my particular gift)", during the summer of 1864 and 1865. "During the winter months I took to drawing, as painting, for want of light, is out of the question". He travelled widely in England, Wales and Europe, losing or leaving behind piles of belongings as he moved from place to place. Despite the freedom and prosperity he enjoyed during

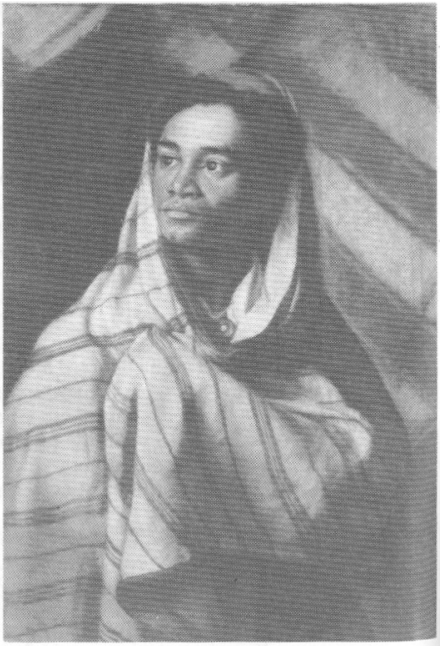
this period, Smith gives the impression of an increasingly bitter, almost defeated man. His health continued to worry him and his correspondence reveals that many fell foul of a short temper and a moody disposition.

CONTROVERSY

From 1865 Smith started again to submit work regularly to the Royal Academy in London. In 1869 he submitted two works: both life-size paintings of un-named black African men, and quite unlike anything he had painted before. One, 'The Pipe of Freedom', contained obvious references to the emancipation of the slaves in America in 1863. This work was rejected by the Academy, according to Smith on 'Political grounds', but was hung at the 'Select Supplementary Exhibition' round the corner from the RA. Smith was on the Committee which organised this, three quarters of which consisted of works rejected from the Academy. He claimed that the work accepted by the Academy - 'The Fellah of Kinneh' - was hung 'out of sight'. A fellow artist George Cole however declared that it was "full of character and expression and as lucid in colour as anything in the exhibition".



The Pipe of Freedom



Fellah of Kinneh

A FINAL ACT

It is not known for how long Thomas had discussed his idea of building a 'Museum or Institute' in Stirling, but in November 1869 he drew up a 'Trust Disposition and Settlement', appointing his friend A. W. Cox, James Barty his solicitor and friend in Dunblane, and the current Provost of Stirling, to act as Trustees. "It being my desire to contribute to the welfare of the Town and District of Stirling in Scotland". Smith agreed to give £5000 to the Town of Stirling for the building of an Institution if, by November 1871, they had provided a site. Smith also agreed to leave the bulk of his estate to Trustees for the purpose of fulfilling his wishes in the event of his death, and maintaining the Institution once built.

Shortly after signing this agreement Smith travelled to the South of France, arriving in Avignon in early December. He found it bitterly cold, was unable to find lodgings to his liking, and eventually resorted to staying in the Hotel d'Europe. Although it was too cold to paint out of doors, days of brilliant sunshine made him long to take up his brush, but he found it difficult to settle down to work.

On the evening of 31 December he suffered a stroke as he rose from his dinner-table, and within minutes he was dead.

THE TRUSTEES

It took some days for the news of Smith's sudden death to reach his friends in England. His Edinburgh lawyer William Ferguson and his friend Cox decided to go to Avignon to collect his possessions, and find out in detail what had happened. On 28 January Ferguson wrote home to say that, having found no record of Smith's wishes as regards his burial, they had decided to leave his remains in Avignon, but they had a new coffin made, disinterred the body and reburied it in a piece of ground they had bought, and ordered a monument for the grave.

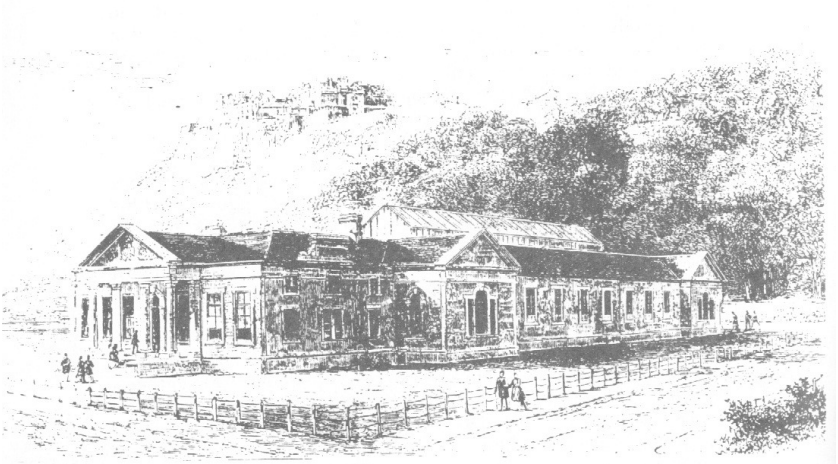
Taking Smith's possessions with them, including several paintings, Cox and Ferguson travelled to Paris, to collect more pictures, and then to London. There were particular concerns about the safety of Smith's belongings in his rooms in Fitzroy Square. They found pictures there "in a state of extreme confusion", and both more numerous and more valuable than expected. Ferguson felt that the pictures would "form a Gallery unequalled in Scotland out of Edinburgh". Under Cox's guidance they numbered and packed the pictures ready for removal to Edinburgh, finding as they did so over 200 of Smith's own works. While in London they also had to deal with the disappointment of some of Smith's friends, only one of whom had been left any money in his will.

PLANNING THE INSTITUTE

Thomas Smith's own specification for the Institution to be built was that it should be *''composed of three principal rooms of offices and store rooms, with space left on either side for contingent additions. The style of the building to*

be plain (Italian), but of first-rate material and construction - the three rooms to be a Museum, a *Picture Gallery, and a Library and Reading Room, adapted for the benefit of the Artisan andWorking Classes".*

The Trustees chose the well-known Edinburgh architect John Lessels to design the building, but had difficulty in fixing the site. They and the Town Council preferred a site to the west of the bowling green in Dumbarton Road, but a large number of people in Stirling felt that Mr Smith's good intentions towards the 'Artisan and Working Classes' would not be fulfilled by siting the Institution so far from the centre of town. Although a petition was signed by 1,400 people requesting the Council to find another site, a more suitable one could not be found, and a foundation stone was laid on the 2-acre site in early 1872.



The new Smith Institute as shown in the Graphic 29th August 1874

Smith Institute as shown in the Graphic 29th August 1874

THE OPENING

The design of the building incorporated a house for the 'Keeper', and after applications had been received, Mr Alexander Croall of Derby took up his post on 15 October 1873. His salary was £104 per annum (with free house, coal, gas and water). The heating system supplied to the Institute was not, however, extended to the house. In July 1874 the Trustees increased his salary to £120 p.a. because of 'the great zeal and industry shown by him'.

Croal must indeed have been busy, for the exhibition planned for the opening of the building was to include, as well as Smith's own collection ol |'.)intings, works of art loaned by over 50 individuals and institutions. I In[1] museum rooms were to include a variety of other precious items lent by the South Kensington Museum, among others, and examples of manufacturing processes lent by both local and national firms.

On Tuesday 11 August 1874 the shops in Stirling closed at noon, for the town to enjoy a special holiday. Shortly after one o'clock the Provost of Stirling welcomed guests to the opening of the Smith Institute.

T. S. SMITH — A SHORT BIOGRAPHY

1816 (Or late 1815) Birth of Thomas Stuart Smith (place and date of birth still unknown).

1827/8 Goes to boarding school at Bourbourg (near Calais).

1834/5 Thomas working as junior master at this boarding school.

1835/6 In London, hears of his father's death, and of the existence of his uncle. Alexander, in Scotland. Receives first gift of money from uncle in September.

Tutor to Henri de Meffray. with whose family he is living near Grenoble.

Arrives in Naples with the de Meffray family, possibly in May.

By September he is living on his own. being supported by his uncle and studying art seiiously.

Still in Naples, but visits Sicily at the end of the year.

Again visits Sicily, possibly from October until May 1842.

1843-47 In Naples. Venice and Rome areas, continually painting, and still receiving financial support from his uncle.

-1848 Possible prolonged residence in Rome. In November. Mazzini declares the Roman Republic.

1849 In Paris by May, bringing pictures for the Paris Salon and the London Royal Academy. Has works accepted lor both exhibitions. In Paris he hears of his uncle's death, then travels to London.

1850-55 Thomas gathers evidence for his claim to Alexander Smith's estate. He earns money by painting portraits, possibly based in Nottingham.

1856 In February, learns of the success of his ease. In Italy the following winter.

1857 Takes up residence at Glassingall House near Dunblane.

1858-62 Lives mostly at Glassingall. with occasional visits to Italy.

1863 Sells Glassingall Estate, and moves to Bedford Hotel in London, where he lives for about two years.

BOOK REVIEWS

THE BALFRON HERITAGE. J. Thomson. Balfron Heritage Group. 1991 84p. ISBN 0 9517785 01. £7.99.

Balfron raised much interest by its 1990 exhibition celebrating the bicentenary of the Ballindarroch Cotton Mill, and the expansion of the village from a few houses round the Clachan to the sizeable settlement of today. The history chronicled here goes much further now, and while Balfron does not figure in any central events it has a sprinkling of interesting historical connections; including 'wife-napping' by Rob Roy's sons, republican weavers of the Bonnymuir Rising of 1820, the architect Alexander 'Greek' Thomson, and the kite and glider experiments of the flight pioneering Barnwell brothers.

The book is well produced with effectively presented photographs, maps and plan. The author and the Heritage Group are to be congratulated on having brought together records and collective memories of their community in a manner which will stimulate local interest, and serve as a model to other communities who may be awakening to a realisation that they too have a story worth telling.

KM/LC

DISCOVERING THE PENTLAND HILLS. Jim Crumley. John Donald, Edinburgh. 1991. 150pp. ISBN 0 85976 331 5. £7.50.

We in central Scotland might think the Pentlands less spectacular than our Ochils, yet they already have, as Crumley tells, quite a published literature e.g. *Call of the Pentlands, The Breezy Pentlands, Pentland Walks with Literary and Historical Associations, Hills of Home.* Our Ochils, which are such an outstanding feature of central Scotland, have by comparison nothing in the general literature like these. We have the tales, legends and poetry of Menzies-Fergusson and Rennie McOwan, some publications on particular aspects e.g. mines, birds, woollen mill buildings; and parts in books like *Royal Stirling* and the University's survey The *Stirling Region* - hardly comparable!

Jim Crumley, walker, journalist, photographer, gives us here an absorbing read, nicely produced and illustrated, on his own delights in the Pentlands, scenery, history, wildlife, people lore, literary associations. The latter are of particular interest to FN & H for their Robert Louis Stevenson associations since we have RLS and The Trossachs in this issue and have previously had RLS at Bridge of Allan. We will shortly be publishing a simple introduction to the Ochils, and it would be great if this might encourage someone to write a Crumley like book on 'Discovering the Ochil Hills'. L.C.

EXCAVATIONS AT THE BURGH OF AIRTH

Geoff Bailey Falkirk
Museum

The property to the west of the Elphinstone Inn facing the mercat cross of Airth was explored in April 1989 by Falkirk Museum Service in advance of sale by the Estates Department of Falkirk District Council. A trench 11.3m long by 2m wide was dug along the western side of the plot (Trench A) with a further trench 8.6m to the north (Trench B) in line with it (see figure 1).

THE EVIDENCE

The earliest feature found was a small gulley (020) at the western end of the main excavation trench. It was aligned almost NNE-SSW, 36cm wide with a shelf on the east only 3cm deep and a channel 6cm deep on the west. This had been dug into the brown-orange natural sandy-clay and later truncated by the deposition of 30cm of a humic rich dark loamy soil (018). Also sealed by this layer was a line of charcoal (019) bedded into the natural. The dark loamy layer contained some green glazed pottery of seventeenth/eighteenth century type. It had been partly dug into by the large stone foundation (015). This foundation had been laid by placing it on 16cm of layer (018) at the northern side of the trench and cutting it slightly into the natural as the latter rose southwards. The foundation was 80cm wide with the larger stones being placed on the east side. It contained no mortar or clay except right up against the south trench edge where a later doorway had been inserted. However, only a single course of masonry survived. To the east of this foundation the black loam 018 merged into a deposit of small stone and pottery (013) upon which the brick walls (010) were set and through which a series of drains had been cut. The brick wall running NW-SE had been placed off centre from a stone rubble foundation (008). Bordering this rubble on the east a small pit (007) measuring 0.8m by 1.4m had been cut 0.12m into the natural. It had been filled with the same silty loam fill which surrounded the pottery of 013 and also contained some small fragments of this pottery. This layer covered the whole area east of foundation 008. On its surface rested the base of an oven which formed a bowl shaped feature filled with reddened ashes (009). The natural sloped noticeably down from south-west to north-east, falling 1.4m from the opposing ends of trenches A and B. Between the natural layer 013 the level was made up by a buff coloured silty-clay with charcoal flecks (017). In Trench B 017 was 0.5m thick with 0.8m of topsoil.

INTERPRETATION

The earliest deposit on the site appears to be the buff coloured clay with charcoal flecks (017) which forms a wedge shaped layer over most of the NE part of the site. The uniform nature of this layer and the lack of

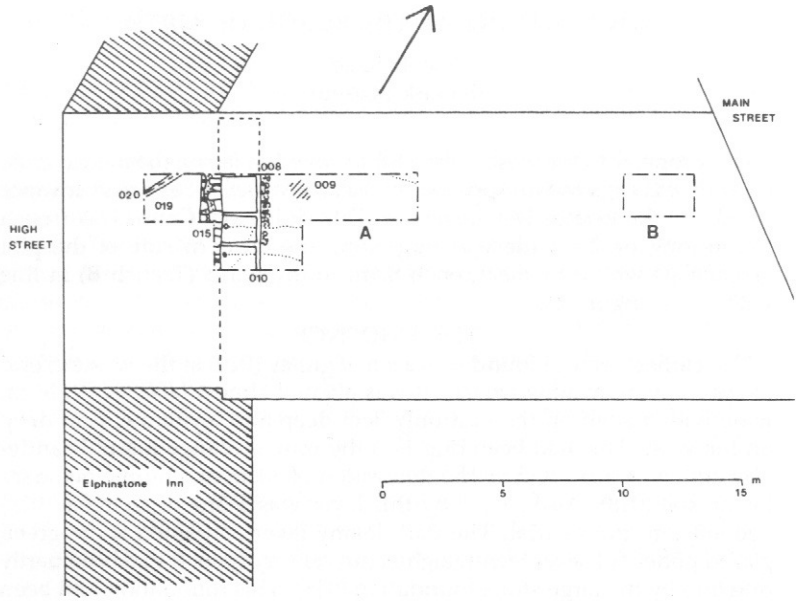


Figure 1: Location plan of excavation trenches – main features

finds suggest that it represents 'natural' silting, the charcoal indicating that there was occupation in the vicinity at the time. A large piece of green glazed pottery was found in Trench B between 017 and the natural boulder clay showing that 017 was deposited in the late Medieval period. It would appear that layer 017 represents the beginnings of the land reclamation in this area by a process known as warping. The process of warping involved the construction of sea embankments on the seaward side of the land to be reclaimed and along any natural water courses. These banks allowed the tidal water to enter, but slowed its egress to such an extent that the silts that it carried were deposited behind the embankment. In this way vast quantities of mud raised the level of the new fields until it was only covered at spring tides and not at all by neap tides. At this stage the bank would be raised further and the water totally excluded. The new land could then be left to de-salinate naturally and after just a few years would sustain a crop, eventually giving yields higher than the neighbouring fields. As this land lay between tidal levels it could only be effectively drained by the extensive use of clap-drains. These acted as valves allowing the water to issue out of the pipes at low tide, but being closed by the pressure of the rising tidal waters they were temporarily sealed.

This has considerably changed the coastal configuration in the vicinity of Airth which in the Medieval period was situated in a wide bay of the Forth.

The port grew in the sixteenth century (Graham, A. 1969) in the area to the north-east of 'The Wilderness' in the centre of this bay where the Pow Burn issued into the Forth providing a suitable channel through the vast stretches of mud flats or soft sleeches known as slob land. The Pow Burn or South Pow was also a harbour and had been used as such long before the construction of the Laigh town. It was still used in the eighteenth century (Ure 1793). It was on such sleeches along the coasts of the Forth that salt pans were situated making use of the tidal flow, and at New Mills a tidal mill harnessed the energy of these tides. These mud flats were rich in game birds and fishing.

With the settled agrarian conditions that arose after the union of the crowns, through the late seventeenth century and the Action of Union in 1707, landowners paid more attention to improving their estates and increasing the yield therefrom. Trade contacts with the Dutch were plentiful, particularly at the ports of Bo'ness and Airth, and perhaps ideas of land reclamation came from there. In 1710 Sir Robert Sibbald mentions such contact:

> "There is but a small distance betwixt the Mouths of the Water of Carron and Avon: and the Firth here is very Shallow upon this South side for a long way, because of the vast quantity of Earth and Rubbish brought down there by Speats: the Shallowes have the name of the Ladies Scap, where there is great variety of Shells of diverse sorts found, both Marines and Fluviatiles: The Dutch did offer some time ago to make all that Scape, good arable ground and Meadow, and to make Harbours and Towns there in convenient places, upon certain conditions which were not accepted: The Dutch have made many such Improvements in their own Country with their dykes: It is thought this might make the narrow part of the Firth deeper and the Navigation to the upper parts more commodious, if this design were prosecuted."

Not that such reclamation was unique to the Dutch. In any case the process must have already begun at Airth for by 1726 (Shaw 1810) the old shore line had been advanced with the reclamation of over 100 acres. The Old Statistical Account of 1793 notes that -"Within these 25 years, 300 acres have been gained from the river Forth, and made good arable ground. It is defended from the river by a strong dike of sods".

Likewise in Bothkennar, the next parish downstream, land was being obtained in this way:

> "Within these few years, a considerable extent of ground has been gained in this parish and neighbourhood from the Frith, which, though defended at great expence, will soon become a valuable acquisition to its possessors" (Dickson 1793).

The pace of land reclamation in Stirlingshire at the turn of the eighteenth century was considerable (Graham, P. 1812 p274):

In 1788, by Lord Dundas		90
In 1806, by the same		24
In 1809, employed in reclaiming		60
Within these 40 years, by the Earl of Dunmore		120
About to be reclaimed, upon the same property		50
Reclaimed by Mr Graham of Airth		70
Reclaimed by Mr Ogilvie of Gairdoch		70
Reclaimed by Mr Gilmour		30
	Acres	514

Thus it appears that, within these few years, there have been recovered, or are in the course of being recovered by embankments against the sea, no less than 514 acres of the richest soil in Scotland, - land which will let at five guineas per acre." The same source also gives particulars of the embankments used: "With regard to the manner in which these embankments are constructed, the Reporter finds that a year or more before the bank is built, facines of brushwood are fixed down in the clay, by strong palisades, in the line in which the embankment is to be conducted; and over which it is afterwards actually built. By this lie of facines, the mud and floating vegetables, which would otherwise be washed away, are arrested, and a considerable addition made to the soil. The embankment is made of mud or earth, faced, on the side that presents itself to the sea, with large stones, which are procured from the quarry of Longannat, on the opposite side of the firth. The strongest of these embankments are 40 feet wide at the bottom, and 12 feet high, having a slope of two feet to every foot in height. In some situations, a bank of 7 or 8 feet in height is found to be sufficient. A dyke of this kind will defend from the sea for ages; and is kept in repair at an expence so trifling that tenants have no objection to take the burden upon themselves."

A map originally surveyed on 19th February 1810 by the Falkirk land surveyer John Shaw shows the positions of the sea embankments of 1726, 1780,1795, 1802 and 1814 (Shaw 1810). This relatively rapid reclamation can be compared with the warping reported by Cadell at Bridgeness where in the ten year period between 1890 and 1900 a depth of some 10 ft of mud was deposited over an area of 30 acres (Cadell 1913). Behind the 1726 and 1780 embankments Shaw's map shows an earlier bank which fronts the 'East Field' and lies landward of 'The Greens' (see figure 2), both of which are obviously earlier reclamations. Between the East Field and the 1780 line a small, almost triangular area to the east of the northern part of Shore Road (where the 'Herring House' of 1711 was located) represents an intermediate stage in land utilisation and acquirement. A similar boundary south of this, on the west side of the East Field probably reflects an earlier arrangement of this kind. The recent excavations showed that the point from which the reclamations began was only a matter of metres from the High Street. The date at which this area was reclaimed can only

be hinted at by the large piece of green glazed pottery found on top of the natural and below 0.5m of warped silt. It could have been in use in the sixteenth or seventeenth centuries. We may take it that the East Field was reclaimed in the seventeenth century, and that the original coastline would have approximated to the dotted line shown on Figure 2.

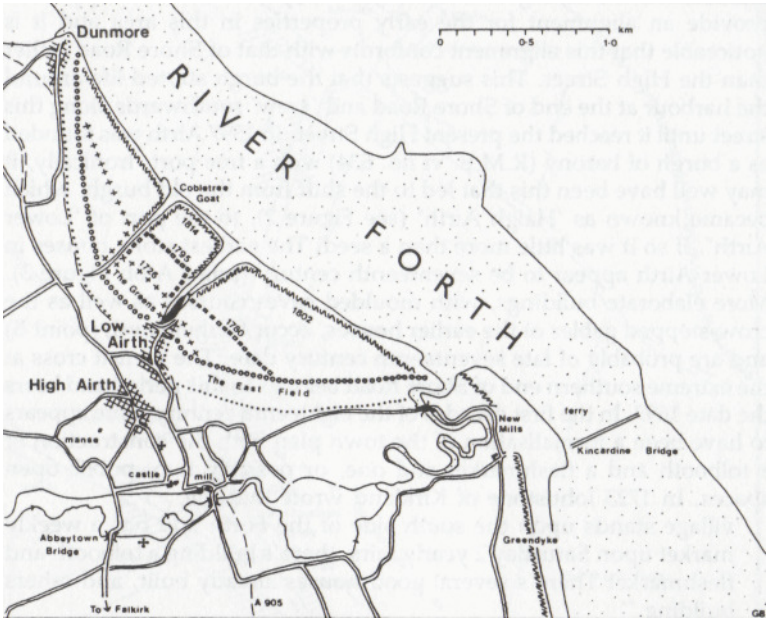


Figure 2: Map showing the locations of successive reclamation dykes at Airth against the early 19th century road network.

There was a tradition that the land around the later burgh had been under the waters of the Forth for in the Statistical Account of 1793 we find that:

> "It is believed, a great part of the low ground, near the river, once made part of its bed, as many sea shells are mingled with the earth; and a few years ago, an anchor was found upon Dunmore hill, by the Earl of Dunmore, about half a mile from the present course of the river, when digging a few feet below the surface. At a small distance from the same place, there is a large stone, called Carling Stone, to which the cables of ships are supposed to have been fastened, and of which there are still evident marks."

On the sixteenth century coastline Higgin's Neuck and the tidal mill of New Mills were located on a conspicuous promontry of the Forth. It was from here

that the ferry to Kincardine operated. Evidence shows that the process of reclamation with the resulting silting caused problems the ferry pier which had to be moved to new sites on at least two occasions. Even in the early eighteenth century the promontory was still distinct as can be seen on Edgar's map (Figure 4), with that at Elphinstone Point (the present Dunmore Village) slightly less obvious.

Apart from the warping the earliest man-made activity on the site was the gulley/slot 020. It was not possible to determine whether this represented a building or boundary. In any case it would appear to provide an alignment for the early properties in this area and it is noticeable that this alignment onforms with that of Shore Road rather than the High Street. This suggests that the burgh started life around the harbour at the end of Shore Road and 'grew' southwards along this street until it reached the present High Street. In 1597 Airth was founded as a burgh of barony (RM.S. vi no. 634) with a free port. Ironically, it may well have been this that led to the shift from the old burgh, which became known as 'Haigh Airth ' (see Figure 2), to the port of 'Lower Airth'. If so it was little more than a seed. The earliest stone houses in Lower Airth appear to be seventeenth century (point A on Figure 3). More elaborate buildings, with moulded eaves courses as well as the crow-stepped gables of the earlier houses, occur further south (point B) and are probably of late seventeenth century date. The mercat cross at the extreme southern end of Shore Road belongs to this period and bears the date 1697. In the first decades of the eighteenth century there appears to have been a formalisation of the town plan with the construction of a tolbooth and a fleshmarket and one, or possibly two, public open spaces. In 1723 Johnstone of Kirkland wrote that the:

> "village stands upon the south side of the Forth and has a weekly market upon Saturday 2 yearly fairs. there's building a tolbooth and fleshmarket There's several good houses already built, and others building. rr

Amongst these good houses we should include the Herring House of 1711 (area D) and the house of 1722 facing the mercat cross (C).

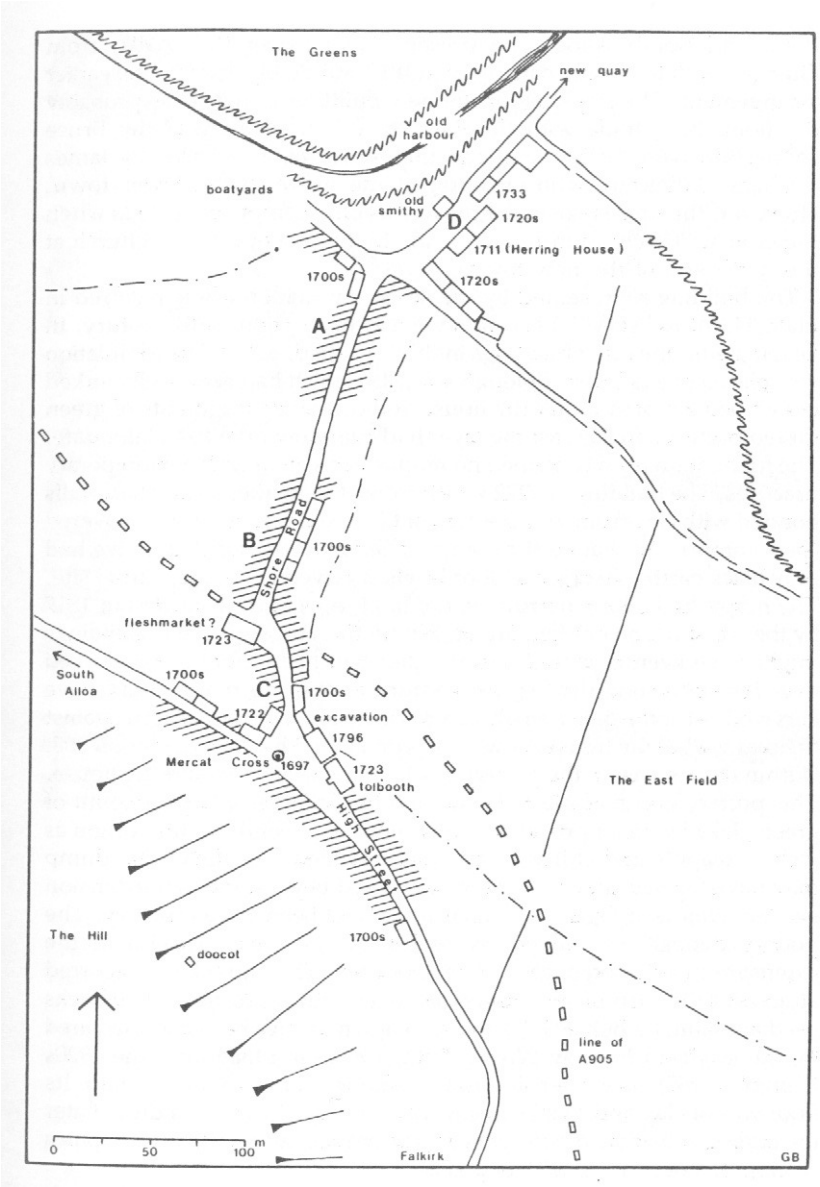
By this stage the burgh had a:

"dock for the building of ships"

and a

"harbour called the Pow for ships of very considerable burden, which are built here very ingeniously and frequently as in any dock in the firth" (ibid)

Trade in coal, salt, hides, timber, etc had made the port very successful and the physical symbol of this wealth is reflected in the later houses. By the mid eighteenth century the lower town was comparable in size to Falkirk. Like Falkirk it had essentially one long street and a triangular shaped market square. However, at Airth the long street led only to the harbour and so became known as the 'Shore Road' with spur roads occurring on the lines of early sea embankments to serve the boat yards and the newly created fields. The 'High


The Greens
new quay
old harbour
boatyards
old smithy
1733
1720s
D
1711 (Herring House)
1700s
1720s
A
B
Shore Road
1700s
fleshmarket?
1723
South Alloa
1700s
C
1700s
1722
excavation
1796
Mercat Cross
1697
1723
tolbooth
The East Field
High Street
The Hill
1700s
doocot
line of A905
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50
100
m
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Street' was used by through traffic which approached Airth from Falkirk via Abbey town Bridge and High Airth. Northwards the road led to the small ports of Elphinstone Point and South Alloa. The present Main Street (the A905) from Grangemouth to Stirling dates only to 1817 and clearly disturbs the earlier arrangement. The impetus for the new building activity was probably the flourishing trade with the Baltic at this time. In 1717 the Bruce connection with Airth ended and the estate was purchased by James Graham, Advocate, who encouraged the move to the lower town. However, the final stage in the move was only completed in 1820 when the Graham family contributed greatly to the cost of the new church at the north end of the new town.

The building represented by the stone foundation 015 is pictured in plate 143 of RCAHMS 1963. In style it is early eighteenth century, in keeping with the other buildings in this area (Ibid, p307). The foundation was placed over a layer of plough soil (018) which had been well worked before being sealed under the house and contained fragments of green glazed pottery. To the east the layer had been re-worked at a later date. The foundation (015) contained no mortar, consistent with contemporary practices. The building of 1722 which fronts the market square had walls bonded with clay from which a coin of George II was recently recovered (pers comm) and that on the corner of Shore Road and Paul Drive had only black earth. No original floor levels survived at the excavation site. The house had a long narrow plot of land to its rear, truncated in 1817 by the construction of Main Street. Within this curtilage timber buildings might have been expected, but the plot had been thoroughly worked over for cultivation during this century and so no traces could have survived. At some date a small lean-to extension had been placed against the rear wall of the house, now only represented by the foundation 008. Within this extension the pottery of 013 accumulated behind the house. This pottery group is still to be studied but includes a large amount of green glazed ware of probably seventeenth/eighteenth century origin as well as teapots and china of the early nineteenth century! The dump may have formed part of a dry midden. Just beyond the first extension lay the oven (see Figure 1) which may have been contemporary. The pottery deposit was effectively sealed by the reconstruction of the extension in brick on slightly different lines. This must have occurred at around the turn of the nineteenth/twentieth centuries as the bricks used are stamped BOGHEAD and are known to have been manufactured by the Boghead Fireclay Works, Bathgate, from c!889 until the 1920s (Douglas 1985). The extension is also shown on the 1912 O.S. map. Its floor was of clay and had been covered with patches of coal dust. Later the outhouse had been converted into lavatories, with earthenware pipes cutting through the earlier deposits.

The prosperity of the early eighteenth century did not last. Although vessels were occasionally still built at Airth, Dunmore and Newmiln in 1793, trade had declined considerably. The blame for this was placed at the door of the Government troops who had burned the vessels along the coast in

Figure 4: Extract from Edgar's map of Stirlingshire (Black)

1745 to stop them falling into the hands of the rebels who had batteries near Airth and Dunmore harbours. The changes in navigation brought about by the land reclamation must have caused problems for those vessels still trying to use the facilities at Airth. Thereafter, with the foundation of the Carron Works and the completion of the Forth and Clyde Canal, trade was drawn away to these places. As ships increased in size, partly as a consequence of the increase in trade, they required deeper and deeper water for their moorings and so Airth would have fallen from favour in any case. The village of Airth slowly became a backwater and the houses fell into disrepair. As early as the 1860s the village was described as being in a neglected condition (OS Name Book). The house adjacent to the Elphinstone Arms, represented by the foundation 015, was demolished some time in the 1960s, when much of the rest of the picturesque village was reorganised by council planning, and has remained vacant since then.

ACKNOWLEDGEMENTS

Falkirk Museum Service would like to thank the Council Estates Department for access to the property. The volunteers who worked hard (as usual) to ensure the success of the excavation were R. Earle, C. Millar, L. Porter, D. Porter and J. Powell. Thanks also to J. Reid for drawing the author's attention to the map by J. Shaw.

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ROBERT LOUIS STEVENSON AND THE TROSSACHS

Louis Stott

> "I have rarely been able to visit, in the proper spirit, tin- wilil .uul inhospitable places of our own Highlands. I am happier where il is tame and fertile, and not readily pleased without trees. I understand that there are some phases of mental trouble th.il harmonise well with such surroundings, and that some persons, by the dispensing power of the imagination, can go back several centuries in spirit, and put themselves into sympathy with the hunted, houseless, unsociable way of life that was in its place upon these savage hills."

Writing in the *Portfolio* in 1874, Stevenson (1850-94) expressed these sentiments in an ironically entitled piece *On the Enjoyment of Unpleasant Places.* Evidently he had in mind a wilder part of the Highlands than the Trossachs, and from the allusion to the absence of trees it is surmised he is referring to his sojourn in Wick in 1868. His thesis is instructive. There are very few places, he argues, which are attractive unless you are prepared to find them so, or are assisted in doing so by some association which they have. He points out in the same essay the influence of Scott -

> "I suppose the Trossachs would hardly be the Trossachs for most tourists if a man of admirable romantic instinct had not peopled it for them with harmonious figures, and brought them thither with minds rightly prepared for the impression. There is half the battle in this preparation."

Stevenson himself provides such associations. It is, for example, known that he began *Treasure Island* in Braemar. He was an inveterate starter and stopper of work, and, like many other writers, was frequently more comfortable writing about places at a distance. He was also a traveller who moved on in search of good health. Stevenson associations are, for these reasons, less specific than those sometimes provided by, say, Scott; as a writer Stevenson is much more impressionistic than Scott. These few Stevenson associations are, none the less, interesting literary curiosities; and, if they are tenuous links which sometimes echo, and at other times illuminate, the work of other writers, no one would have been more delighted than himself.

In the Trossachs his love of Scott, and *Kidnapped,* link him with Rob Roy and the MacGregors. His friendship with Andrew Lang links him with Robert Kirk, Minister of Balquhidder and of Aberfoyle, and back to Scott. As a boy RLS visited the district, and there are some other connections. (For the purposes of this paper the Trossachs are taken to be that district which has as its outposts Inversnaid, Balquhidder, Callander, Uam Var (Uamh Mhor), the Lake of Menteith and Aberfoyle).

Stevenson himself paid a number of well-attested visits to Bridge of Allan between 1853, when just 2V2years old, and 1875 when he wastwenty-four. These visits have given rise to two rather similar books: MacCulloch (1927), author of *The Misty Isle otSkye,* and Morris (1929), the Town Clerk of Stirling; and to various articles in journals (e.g. Angus 1978, 1981; Stott 1991). Stevenson had an undoubted affection for the place -

> "1 shall never forget some of the days at the Bridge of Allan. They were one golden dream."

The Stevenson family was connected with the Stirling District in a number of ways. Robert Stevenson, RLS's grandfather, designed the new bridge, reported on the harbour and in 1826 on the springs which were to bring prosperity to Bridge of Allan as a Spa. There can be little doubt that the Stevensons, who frequently spent more than a month at the resort, took the excursions to Aberfoyle and the Trossachs recommended in *A Week at Bridge of Allan* by Charles Rodger, first published in 1851. However, there are few references to these places in RLS's works.

David Morris points out that Stevenson's interest in the MacGregors was almost certainly aroused at Bridge of Allan. Throughout his life he pursued a supposition that Stevenson may have been one of the names adopted by that proscribed clan, and sought evidence that he might be descended from them.

> "It is certainly a very interesting subject, though I don't suppose it can lead to anything this connection between the Stevensons and the M(ac)Gregors....."
>
> Letter *to Sir Herbert Maxwell* 1 Dec 1894

We also know that when he was eight Stevenson visited Perthshire beyond Dunblane and Bridge of Allan, and dictated a childish *Tour of Perthshire* to his mother. This visit was to Dundee, Crieff - probably Drummond Castle - and Loch Earn. In August and September 1866, when RLS was fifteen, the Stevensons took a house in Callander. His mother's *Diary* gives information about the stay: "we have a succession of young visitors and Lou has his pony and enjoys himself". Francis Watt (1913), states that Stevenson resided for some time in Balquhidder, but this is probably a misreading of Graham Balfour's reference to his visit to Lochearnhead with his father in the early summer of 1882.

> "He made a week's expedition with his father to Lochearnhead, hard by the Braes of Balquhidder. Here he made inquiries about the Appin murder, perpetrated only forty miles away, and was successful in finding some local traditions about the murderer still extant."
>
> Balfour (1901)

Colvin(1924 and Note 1) describes this visit thus-

> "after a short excursion from Edinburgh into the Appin country where he made inquiries on the spot into the traditions concerning the murder of Campbell of Glenure; his three resting places in Scotland during this summer were Stobo Manse, near Peebles, Lochearnhead, and Kingussie."

Stevenson's own account of this visit with his father in a 'Note to Kidnapped', Arnold (1923), is enigmatic (Note 2). Of course, 'living traditions' about the Appin Murder would have been obtainable both in Balquhidder and in Appin, but Stevenson does not mention Balquhidder -

> "I visited Appin in the early summer of 1880. It was thx last of many journeys with my father. It was the first time I had travelled with him since we were at all on a footing of equality. The iveather was very wild; we were confined whole days to the inii parlour, at Glenorchy, at Oban and elsewhere... At Balachulisli we had no difficulty in finding the cairn that still marks the place iif death ..... "

However, it is certain that RLS first investigated these stoi |es for a book which, in the end, he did not write, although he made good use of his knowledge in *Kidnapped* and *Catriona.* This scheme for a) *listory of the Highlands* was sent to his father from Davos in December 1880. They discussed it with Principal John Tulloch at Strathpeffer during the previous summer when his father was trying to dissuade RLS from publishing what he considered a rather disreputable account of his son's adventures as an emigrant. This scheme had been transformed into something like *Kidnapped* by October 1881 when he wroto from Davos again saying —

> "It occurred to me last night in bed that I could write - The Murder of Red Colin A Story of the Forfeited Estates" (Note 3) Both Morris and MacCulloch (op cit) deal with the connections between the ill-fated Stewart of Acharn, James of the Glen, and the Jacobite families who lived in the Stirling district. At the same time, it is believed, the real Alan Breck Stewart was in Stirling and Balquhidder plotting a rising with James. It is also surmised that Stevenson obtained the idea for 'the adventures of David Balfour' - the combined *Kidnapped* and *Catriona* - from this locality. It resembles the story of the difficulties in establishing his right to his inheritance, experienced by Thomas Stuart Smith of Glassingall, near Dunblane, the founder of the Smith Art Gallery and Museum in Stirling. The house passed in 1802 to two brothers called Alexander and Thomas Smith. They both fell in love with the same girl and, in the end, Thomas, father of Thomas Stuart, married the girl, while Alexander took the estate. The mother died in childbirth, and his father left him in the care of French foster parents. His uncle Alexander made him an allowance, but when he died in 1849 Thomas had much difficulty in proving his right to Glassingall. The case is, of course, similar to that of David Balfour, and it seems highly likely that Stevenson, (whose own great grandfather, the engineer, was called Thomas Smith) heard the story in his youth at Bridge of Allan. T. S. Smith, who was an artist, sold Glassingall in 1863, and directed that the proceeds be used to found the Smith Art Gallery and Museum, opened in 1874 (see pp 101-109). Stevenson and his parents visited the new institution in 1875. Aberfoyle has two distinct, if interconnected, claims to literary fame.

The more notable is that Sir Walter Scott set the most telling scenes of *Rob Roy* there, but the literary provenance of the place goes back further to the minister of the Parish from 1685 to 1692, Robert Kirk, who was also, at one time, minister in Balquhidder. Like many ministers he was a noted scholar who, among other achievements, was the first to translate the Psalms into Gaelic, and he was asked to superintend the publication of the most significant Gaelic Bible of the seventeenth century. However, it was his interest in fairies and his publication of *The Secret Commonwealth* (1691), about Scottish fairies, which gave him a lasting reputation. In the last decade of the twentieth century there is less interest in fairies than there was in the seventeenth century. Kirk might be perceived, on this account, as a figure of fun, and receive less attention than he deserves. In considering his life and influence it is essential to recollect that, until very recently, superstition played an important part in country life. Indeed it still does. Much that was then unexplained made sense if you involved fairies.

Scott used Aberfoyle in 'Rob Roy', and makes much of Kirk and Aberfoyle's Fairy Knowe as a literary device (Note 4) to mark the transition from the Lowlands to the Highlands. Stevenson was lavish in his praise for *Rob Roy* -

> "Time and again I tried to read Rob *Roy,* with whom, of course, I was acquainted from the *Tales of a Grandfather;* time and again the early part, with Rashleigh and (think of it!) the adorable Diana, choked me off; and I shall never forget the pleasure and surprise with which, lying on the floor one summer evening, I struck of a sudden into the first scene with Andrew Fairservice. 'The worthy Dr Lightfoot' - 'mystrysted with a bogle' - 'a wheen green trash' - 'Jenny, lass, I think I'll ha'e her': from that day to this the phrases have been unforgotten. I read on, I need scarce say: I came to Glasgow, I bided tryst on Glasgow Bridge, I met Rob Roy and the Bailie in the Tolbooth, all with transporting pleasure: and then the clouds gathered about my path; and I dozed and skipped until I stumbled half-asleep into the Clachan of Aberfoyle, and the voices of Iverach and Galbraith recalled me to myself. With that scene and the defeat of Captain Thornton the book concluded; Helen and her sons shocked even the little schoolboy of nine or ten with their unreality; I read no more, or I did not grasp what I was reading; and years elapsed before I consciously met Diana and her father among the hills, or saw Rashleigh dying in the chair. When I think of that novel, and that evening, I am impatient with all others; they seem but shadows and impostors; they cannot satisfy the appetite which this awakened; and I dare be known to think it the best of Sir Walter's by nearly as much as Sir Walter is the best of novelists. Perhaps Mr Lang is right, and our first friends in the land of fiction are always the most real."
>
> RLS *Rosa Quo Locorum* 1896

Andrew Lang (1844-1912), folklorist, poet, novelist and historian had met Stevenson. Lang was a pivotal literary figure of his time, regarded as somewhat slapdash perhaps, but a man of great enthusiasms. He edited the Swanston Edition of Stevenson's Works. On account of his interest in folklore, Lang having a great interest in Kirk wrote the introduction to the 1893 edition of the *Secret Commonwealth* (as had Scott to an edition of 1815) and his dedication addressed to Stevenson, provides a further literary connection. RLS was then in Samoa, where he was known as 'Tusitala', said to mean 'teller-of-tales'. Stevenson was, of course, much interested in the Kirk of Scotland, in the Covenant, and in the weird and the supernatural; and the habit of writing poems about fellow denizens of the literary jungle was quite prevalent in late Victorian times. Earlier Stevenson himself dedicated poems to Lang (Note 5), S. R. Crockett, Henry James, and Henley among others. Lang's dedication is an amusing but neglected dialect poem -

TO ROBERT LOUIS STEVENSON O Louis! you
that like them maist, Ye're far frae kelpie, wraith,
and ghaist, And fairy dames, no unco chaste,
And haunted cell. Among a heathen clan ye're
placed,
That kensna hell!

Ye hae nae heather, peat, nor birks, Nae
trout in a' yer burnies lurks, There are nae
bonny U.P.Kirks,
An awfu' place! Nane kens the
Covenant o' Works
Frae that of Grace!

But whiles, maybe, to them ye'll read
Blads o' the Covenanting creed,
And whiles their pagan wames ye'll feed
On hailsome parritch; And syne ye'll gar them
learn a screed
O' the Shorter Carritch

Yet thae uncovenanted shavers
Hae rowth, ye say, o' clash and clavers
O' gods and etins - auld wives' havers
But their delight; The voice o' him that tells
them quavers
Just wi' fair fright.
And ye might tell, ayont the faem, Thae Hieland clashes o'
our hame To speak the truth, I takna shame.

To half believe them;
And, stamped wi' TUSITALA'S name,
They'll a' receive them.

And folk to come, ayont the sea,
May hear the yowl o' the Banshie, And
frae the water-kelpie flee,
Ere a' things cease, And island
bairns may stolen be
By the Folk o' Peace.

That Lang should think of Stevenson in connection with Kirk was entirely understandable. Whether Stevenson knew of Lang's dedication is not clear, as no correspondence has survived, although the two authors were, at that time, half a world apart and contemplating a literary collaboration. However, if he did not know, it is a remarkable coincidence that, in the same year, Stevenson was thinking of the Trossachs. On 6th June, 1893 he wrote in a letter to Sydney Colvin -

"I was standing out on the little verandah in front of my room this morning, and there went through me or over me a wave of extraordinary and apparently baseless emotion. I literally staggered. And then the explanation came, and I knew I had found a frame of mind and body that belonged to Scotland, and particularly to the neighbourhood of Callander. Very odd these identities of sensation and the world of connotations implied; highland huts and peat smoke, and brown swirling rivers, and wet clothes, and whisky, and the romance of the past, and that indescribable bite of the whole thing at a man's heart, which is - or rather lies at the bottom of -a story."

Stevenson enthuses about Scott, delighting in *The Lady of the Lake,* and it is hard to believe that in ten visits to Bridge of Allan he did not visit at least some of the sites associated with the Wizard of the North. Here is Stevenson in Memories *and Portraits: A Gossip on Romance* on Scott -

"Walter Scott is out and away the king of romantics. *The Lady of the Lake* has no indisputable claim to be a poem beyond the inherent fitness and desirability of the tale. It is just such a story as a man would make up for himself, walking in the best of health and temper, through just such scenes as it is laid in. Hence it is that a charm dwells indefinable among these slovenly verses, as the unseen cuckoo fills the mountains with his note: hence even after we have flung the book aside, the scenery and adventures remain present in the mind, a new and green possession, not unworthy of that beautiful name, *The Lady of the Lake,* or that direct, romantic opening - one of the most spirited and poetical in literature - The stag at eve had drunk his fill."

The genesis of 'the adventures of David Balfour' at Bridge of Allan has already been surmised. In one of his prefaces Stevenson comments that nobody reads them, and one wonders whether he had the same-view

about introductions, because Scott deals at length with the events on which *Kidnapped* and, to a greater extent, *Catriona* hinge in his introduction to *Rob Roy*. In a letter to his father while he was writing *Kidnapped,* in the spring of 1886, Stevenson comments "I find it a most picturesque period, and wonder Scott let it escape." In a sense Scott did not, because he tells the tale in the introduction to *Rob Roy*. James Mhor, and Robin Oig MacGregor are there, as are Alan Breck Stewart and James Stewart of the Glen. Perhaps, in this instance, Scott felt that the truth was as impressive as fiction. It is considered that Stevenson very nearly succeeded in writing a great novel about these events, one which has often been compared with Scott, and one which, in its evocation of Highland character, is by some considered superior to Scott.

The chapter of *Kidnapped* set in Balquhidder is topographically imprecise which might suggest that Stevenson was unfamiliar with the ground, but it might equally be a deliberate device on the part of the novelist to enhance the pace of the novel. The chapter is concise, and full of allusions to the incidents surrounding the imprisonment of James Mhor which is the subject of the sequal, Cafriona. We can suppose, for Stevenson does not tell us exactly, that Duncan Dhu MacLaren's house is near the head of the glen, perhaps at Invernenty. In introducing Robin Oig, Stevenson says 'He was sought upon all sides on a charge of carrying a young woman from Balfron and marrying her (as was alleged) by force'. This is the briefest possible reference to Balfron. In a letter about the map for *Kidnapped,* the author asked that both Kippen and Balfron be shown which suggests that he may have intended to elaborate further on the kidnap by Robin Oig of Jean Key, the widow, bred in Balfron, who married a laird who lived in Kippen. However, the only other reference is from Alan Breck who quotes Bailie Nichol Jarvie at Aberfoyle in Scott's *Rob Roy-*

> "It is the chief principle of military affairs," said he, "to go where ye are least expected, Forth is our trouble: ye ken the saying 'Forth bridles the wild Heilandman.' Well, if we seek to creep round about the head of that river and come down by Kippen or Balfron, it's just precisely there that they'll be looking to lay hands on us."
>
> *Kidnapped*

RLS goes on to mention Strathyre, and then takes his two fugitives to Uam Var - with its echoes of *Lady of the Lake* - before landing them beside the Allan Water.

Catriona, James Mhor's spirited daughter, is considered to be Stevenson's most successful woman character and, at the beginning of that novel, David Balfour's knowledge of Balquhidder is the means by which he becomes acquainted with her. Here Stevenson introduces 'the men of peace', Kirk's fairies -

> "I was infinitely taken with the spirit of the maid. 'I could be wishing I had brought you a spray of heather,' says I. 'And although I did

ill to speak with at first, now it seems we have a common acquaintance. I make it my petition you will not forget me. David Balfour is the name I am known by. This is my lucky day, when I have just come into a landed estate, and am not very long out of deadly peril. I wish you would keep my name in mind for the sake of Balwhidder,' said I, 'and I will yours for the sake of my lucky day.' 'My name is not spoken,' she replied, with a great deal of haughtiness. 'More than a hundred years it has not gone on men's tongues, save for a blink. I am nameless like the Folk of Peace. Catriona Drummond is the one I use.'

Now indeed I knew where I was standing. In all broad Scotland there was but one name proscribed, and that was the name of the MacGregors. Yet so far from fleeing this undesirable acquaintance, 1 plunged deeper in."

David Balfour returns to Balquhidder later by Allan Water and Uam Var, but in bad weather. There is even less topography of the Trossachs in *Catriona* than in *Kidnapped,* and RLS quickly continues Balfour's journey to the trial at Inveraray. The most direct way would have been by the funeral road Bealach nan Corp, at the head of Glengyle, and the Lairig Arnan. -

"In the press of my hurry, and to be spared the delay and annoyance of a guide, I had followed (so far as it was possible for any horseman) the line of my journey with Alan. This I did with open eyes forseeing great risk in it, which the tempest had now brought to a reality. The last I knew of where I was, I think must have been about Uam Var; the hour perhaps six at night. I must still think it great good fortune that I got about eleven to my destination the house of Duncan Dhu (MacLaren). Where I had wandered in the interval perhaps only the horse could tell. I know we were twice down, and once over the saddle and for a moment carried away by a roaring burn. Steed and rider were bemired up to the eyes.

From Duncan I had news of the trial. It was followed in all these Highland regions with religious interest; news of it spread from Inveraray as swift as men could travel; and I was rejoiced to learn that, up to a late hour on Saturday, it was not yet concluded; and all men began to suppose it must be spread over to Monday. Under the spur of this intelligence I would not sit and eat; but, Duncan having agreed to be my guide, took the road again, with the piece in my hand and munching as I went. Duncan brought with him a flask of usquebaugh and a hand-lantern; which last enlightened us just so long as we could find houses to re-kindle it, for the thing leaked outrageously and blew out with every gust. The more part of the night we walked blindfold among sheets of rain, and day found us aimless on the mountains. Hard by we struck a hut on a burn-side, where we got a bite and a direction; and, a little before the end of the sermon, came to the kirk

doors of Inveraray." The literary pace achieved by Stevenson in this passage is the subject of a telling comment by one of his imitators, John Buchan (1875-1940), in an essay entitled *Literature and Topography* -

"I will give you another specimen of Stevenson's cunning. David Balfour, you remember, is imprisoned on the Bass Rock in order to prevent his being present at the trial of James Stewart at Inveraray; but he manages to get off earlier than he had hoped, and rides hard for the West. Now a dull writer, in order to get the effect of speed, would have loaded his pages with irrelevant topography, and a minute time schedule. Stevenson was wiser; this, he felt, was no case for a map, and swiftness must be got by some other means. So he is economical with his detail. David is set on shore at Clackmannan Pool (Pow) on Saturday afternoon at 2; an hour later he is in Stirling; at 6pm he is somewhere about Uam Var, and at 11 reaches the house of Duncan Dhu. He leaves straightaway on foot and reaches Inveraray before the end of the sermon on Sunday morning. It is all we want.... To my mind the journey is incredible, for no man I think, could start on his two legs about llpm from somewhere on the (east) side of Balquhidder, after having ridden from Clackmannan, and be in Inveraray before noon on the next day. The feat is impossible... But artistically it is wholly right; Stevenson has not already elaborated this piece of country, so the reader's credulity is not strained, while the few selected details are all that is needed to quicken the fancy."

Finally, Stevenson is remembered in an interesting way above Loch Lubnaig on land once owned by Lord Esher who enhanced the literary and artistic associations of Callander during Edwardian times, and between the wars. Reginald Brett, Lord Esher (1852-1930) acquired The Roman Camp, one of Calender's most distinguished houses in 1897 and retired to Callander. He had held several high offices, was Queen Victoria's and Edward Vll's confidante, and a private secretary to George V. There is an admirable biography of him by Lees Milne (1986), the architectural historian. Among literary and artistic visitors to The Roman Camp were D. Y. Cameron, the distinguished painter and etcher, briefly in 1919, Sidonie-Gabrielle Colette (1873-1954), one of the most distinguished of modern French women writers and J. M. Barrie (1860-1937) friend of the Brett family, and a significant admirer of Stevenson. One of Lord Esher's daughters was Dorothy Brett, the painter and member of the Bloomsbury set. On a greenhouse at Roman Camp Lord Esher had a frieze carved bearing the tag, 'Ille Terrarum mihi praeter Omnes Angulus ridet' - that corner of the world smiles for me more than anywhere else. The tag was used by Stevenson as the title of one of his most famous poems (Note 6).

Esher was clearly a keen Stevensonian. Two cartouches, quoting RLS, were attached to the doorway of the little chapel above Loch Lubnaig, which he intended to be his last resting place. The chapel or mausoleum was erected

by a local builder in 1925, and is now roofless. It can be reached by the beautiful Forest Trail which leads to Stank Falls above the loch. He loved the rough-shooting which the estate, now owned by the Forestry Commission, provided. It is still possible to appreciate what a superb site it was, and his affection for the place. The first plaque quotes the poem 'To S.R.Crockett', the Galloway author who had, to Stevenson's delight, dedicated a book to him. It made RLS think of the 'hills of home' -

Grey recumbent tombs of the dead in desert places,
Standing-stones on the vacant wine-red moor,
Hills of sheep, and the howes of the silent vanished races,
And winds, austere and pure: The other is Stevenson's famous epitaph, contained in 'Requiem':

This be the verse you grave for me:
Here he lies where he longed to be;
Home is the sailor home from sea, And the
hunter home from the hill.

These modest literary connections between Stevenson and the Trossachs may not amount to very much, but they are worth recording. As a boy, and not very long before he died, Stevenson, like so many others, came under the spell of the Trossachs.

NOTES:

1. (Sir) Sidney Colvin (1845-1927) was a Professor of Art and later ran the Print Department of the British Museum. He was Stevenson's long time friend, and often acted as his literary agent. He edited RLS's letters and published them in 1899, reprinted 1924.
2. Ernest Mehew has pointed out to me that Stevenson himself misdates the journey, as does David Morris in *Robert Louis Stevenson and the Scottish Highlanders;* this is the trip which took place in 1882. Stevenson was in California until August of 1880 after which he went to Blair Atholl and Strathpeffer. With regard to the itinerary separate visits to Oban, Glen Orchy, and Ballachulish from Lochearnhead would almost certainly have involved two or more one day trips. It can be surmised that the Stevensons hired a carriage, and went to Bridge of Orchy, Ballachulish and Oban, taking two or more days. However, RLS only mentions one specific site: the Campbell memorial cairn near Ballachulish, which could have been reached in a day using the Callander and Oban railway, and the steamer.
3. Morris relates the story of a 'letter' (not included by Colvin in Stevenson's canon) from 'RLS' in the *Stirling Observer* of 20th October 1881 about Rob Roy's sons. However, it is possible that Thomas Stevenson, RLS's father, took the newspaper regularly, and was the source. The 'letter' was reprinted in *Local Notes and Queries Reprinted from the Stirling Observer* Edited by W.B.Cook 1883. This includes the series of

four 'letters' (contributions to 'Notes and Queries'), of which RLS's was one, as articles under the title *Young Rob Roy.* There is a photostat of this in the Beinecke Collection, the most comprehensive Stevenson library. It can be consulted in the Stirling Reference Library.

4. Scott's use of the supernatural to mark the passage 'from reality to romance' is brilliantly treated by Coleman Parsons in *Witchcraft and Demonology in Scott's Fiction* 1964.
5. Ernest *Mehew,* who is editing a new edition of Stevenson's letters confirms that many letters between Lang and Stevenson have been destroyed, and nothing survives dealing with Lang's dedication. It is interesting, if puzzling, to note that one of Stevenson's poems dedicated to Lang appeared in another work, the first, in the 'Bibliotheque de Carabas' series. These two bantered with one another in verse in an intriguing way. Stevenson's first poem dedicated to Lang, 'Dear Andrew with the brindled hair...', was met by 'Dear Louis of the awful cheek...'. On this occasion we are informed by Prideaux, a Stevenson bibliographer, that Stevenson's poem 'To Master Andrew Lang' was only to be found in a few copies of 'Cupid and Psyche' 1887 (the first volume in the series, which had one of Lang's many 'discourses' as a preface) as 'they were rigidly supressed before the book was published' (Prideaux), seemingly by Stevenson, but we are not told why. Lang reprinted his dedication, of 1893, in 1894 in 'Ban and Arriere Ban' (Summoning Everything Up), a collection of his poems, but he omitted the last verse.
6. There is no doubt that *Ille Terrarum* is about Edinburgh, Swanston and *the* Pentlands, but there is a suggestion that it was composed in the Trossachs. This is interesting because Stevenson did compose at least two sonnets at Bridge of Allan and Dunblane, and *Ille Terrarum* carries in it echoes of one of them.

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EDITORIAL NOTES

WORK IN PROGRESS

Our regrets and apologies to authors of papers and books delayed by pressures of space or our limited available resources of labour and facilities.

Several papers held over to volume 15, summer '92 at earliest, include A survey of prehistoric rock art of the Menteith area, by Maarten van

Hoek The demise of a traditional sport: quoiting in central Scotland, by N.

L. Tranter. Communion services in Georgian Stirling, by Andrew Muirhead

Books (still!) in progress with hoped for publication in coming months -
Alloa in days of prosperity, 1830 to early 1900s, by J. Milne.
The Lure of Loch Lomond, by R. McAllister
The Ochil Hills, an introduction; with Clackmannanshire Field Studies

Society (CFSS) Mines and Minerals of the Ochils - a greatly revised version of the CFSS

1974 booklet.

PLANT HUNTERS

We noticed in *Scotland on Sunday's* Magazine last December a diary of experiences on the Botanical Expedition to the Yunnan, China by David Paterson of the Royal Botanic Garden, Edinburgh. This traversed spectacular places not seen since George Forrest's explorations in the 1920s. Since the University has a George Forrest Walk, we arranged with its Airthrey Gardens Group a lecture by Mr Paterson on 20th October last, and we may have something to publish on this. Like Forrest, of rhododendron fame, this expedition collected dried plants for study, and live seed for cultivation, by botanical gardens in this country and around the world.

EDITORIAL NOTES

LOCH LOMOND

Our 16th annual symposium Man and the Landscape last November featured Loch Lomond by lectures and many displays at the University, and some weeks before we had a cruise with commentaries. Tom Weir has given a useful report on it in his 'My Month' article in *The Scots Magazine* for February. As anticipated a more scientific symposium Lymnology of Loch Lomond is being held at Stirling University on 8th and 9th April 1992 to mark the 25th anniversary of the Research Field Station at Rowardennan; it will present the state of knowledge over a wide range of subjects, and the proceedings will be published - probably by the Royal Society of Edinburgh.

Among recent books on Loch Lomond are - *The Trossachs and Loch Lomond — a* pictures booklet by Colourmaster, Tourist Board now at 50p; *Take the High Road* - a picture booklet about 'the real Glendarroch' of the TV soap, 42pp by G. Burke, Auld Lang Syne, £3.95; *Loch Lomond Landscapes* - a personal tour of the loch and its secrets, is a handsome 60 page illustrated 1985 work by Stephen Sankey, now RSPB officer at Vane Farm, and author of the book *Three Degrees West* reviewed here on page 49; and the 1990 reprint of *The Natural History of Loch Lomond.*

We intend shortly ourselves to publish a booklet by R. McAllister *The Lure of Loch Lomond,* 60 pages descriptive of the loch and its islands based on personal sailings and explorings.

With the national parks subject continually in the news, and the special problems of Loch Lomond you might consider supporting the *Friends of Loch Lomond* to keep in touch with affairs and relevant events - membership £4. Mem. Secy. Mrs Jo Keracher, Ravenwood, Arrochar.

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