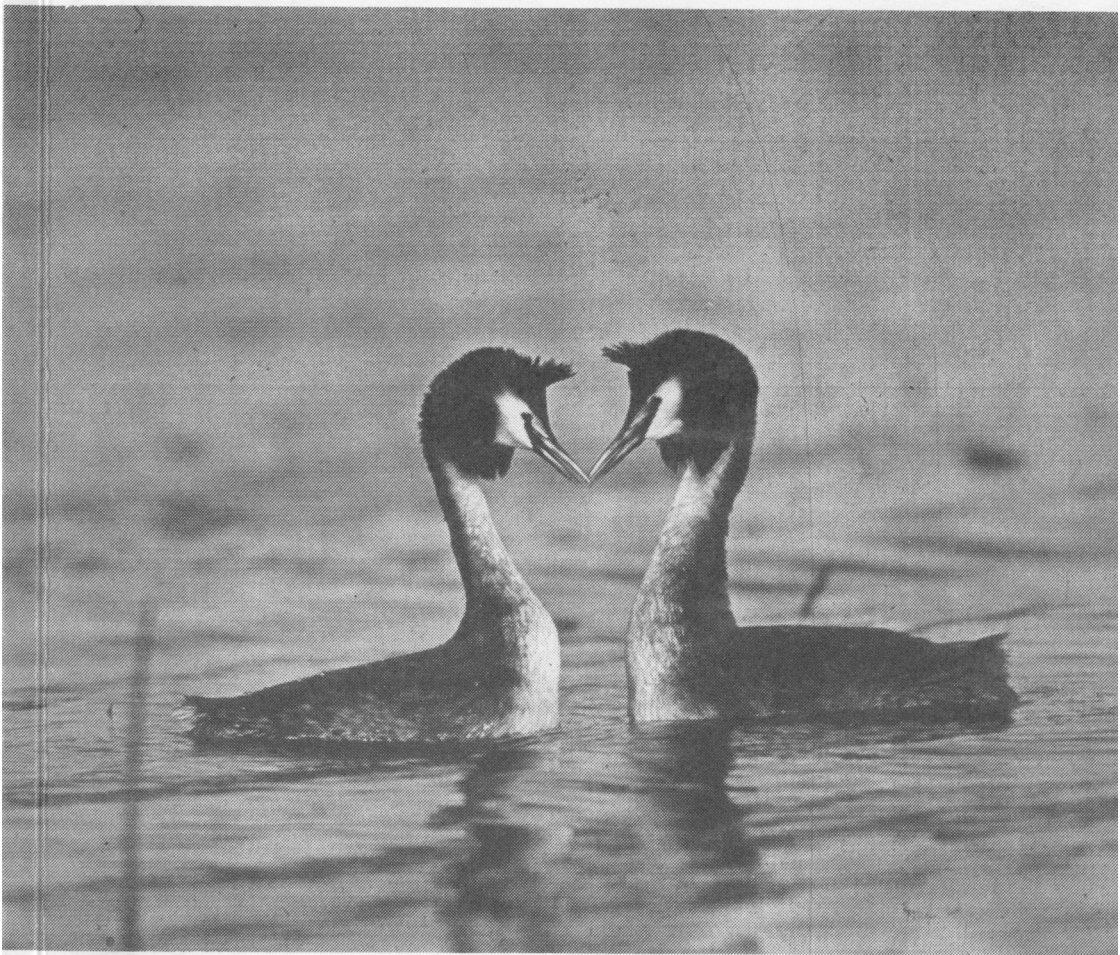


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## GLOBAL WARMING: REALITY OR BAD DREAM?

S. J. Harrison, University of Stirling

*Based on the 1990 Macmorran Lecture to the Royal Pharmaceutical Society*

## INTRODUCTION

The last decade has seen a significant growth in interest in the effects of pollution on global environments, none more so than the enhancement of the greenhouse effect or 'global warming'. Indeed this problem has frequently acquired the status of front-page or special feature news. While it is heartening to see the human species recognising that it has inflicted damage on the natural environment, much of what is written betrays some degree of mis-understanding of the fundamental nature of the global warming problem and can, at times, be misleading. If indeed we are to expect some degree of change in the world's climates there is a real need to reassess the ability of human society to feed, water and shelter an expanding world population which continues to benefit from improved medical care but may at the same time falls victim to far-reaching changes in the distribution of risk from specific diseases. In order to secure the future it will be necessary to review the vital biochemical linkages between human society and the atmosphere.

## GLOBAL WARMING

Expressed in its simplest form, global warming is a rise in the globally averaged near-surface (1.5-2.0m) air temperature resulting from changes in the gaseous composition of the lower atmosphere. In reality it is a complex network of cause-effect linkages involving, for example, the stability of global ice deposits such as the polar ice-caps, the temperature of the oceans, and the workings of what Nigel Calder (1974) has called 'The Weather Machine'. When we consider these more complex aspects of the problem we can begin to appreciate the full implications of global warming. Sea-level rises would offer a direct threat to coastal zone habitation and management; changes in the distribution of moisture lead to modified flood or drought risks; and shifts in global climatic zones can result in deleterious effect on food-production. The effects of global warming are, therefore, far-reaching but are far from adequately understood.

Responses to the perceived threat from predicted global warming have ranged from total rejection through to hysterical doom and gloom. The news media have used a range of headlines, from the baldly scientific to outrageous hyperbolae. While some reporting has been accurate and informative, much has concentrated on worthless sensationalism. The isolated individual who predicts the end of the world and the drowning of millions is thus as likely to reach the pages of the press as the more circumspect findings of a team of senior scientists. Political

responses have been visible but are motivated as much by vote-catching as by a genuine concern for the global environment. The 1989 briefing called by Mrs Thatcher, her involvement in the 1990 Climatic Change conference in Geneva and the publication of the White Paper *This Common Inheritance* have been encouraging signs, but Governmental action has not always matched the rhetoric. A scientific community under financial siege has been all too eager to jump on a global warming bandwagon and there is a suspicion that objectivity has, in some cases, been sacrificed. Published conclusions have not always been supported by rigorous scientific arguments, but have degenerated into conjecture. The scientific community is now beginning to reappraise the evidence and we may be entering a period of more serious debate on the issue.

#### THE GREENHOUSE PROCESS

Global warming is a result of the enhanced absorption of the long-wave infra-red radiation emitted from the earth's surface by specific gases in the lower atmosphere. The fact that these gases absorb little, if any, of incoming short-wave solar radiation means that they are effectively retaining heat energy. The parallel with the action of a greenhouse is unfortunate as this acts to suppress heat loss by convection as much as by the retention of infra-red radiation. We are, however, stuck with the misnomer of the 'greenhouse effect' which is generated by 'greenhouse gases'. It is important to note that this greenhouse effect is not a recent man-made phenomenon but is vital to the development and survival of life on Earth. Without it the surface would not only experience huge swings of temperature between day and night and tropic and pole but would be as much as 30°C colder than at present. The principal greenhouse gases are water vapour and carbon dioxide, which absorb particular infra-red wavebands. The essential nature of the global warming problem is that we have increased the amount not only of carbon dioxide in the atmosphere but also of gases such as methane, nitrous oxide and ozone, all of which are powerful greenhouse agents. In addition to these, we have added a new agent in the form of chlorofluorocarbons (CFC's).

*Carbon Dioxide* forms an essential part of the carbon cycle or the constant exchange of carbon between living matter and the overlying atmosphere. Within this complex cycle there are huge stores of carbon in plants and animals, and in the oceans, in addition to longer term storage in fossil forms such as coal, oil and calcareous rocks. The combustion of coal and oil releases vast quantities of carbon in the form of carbon dioxide. The United Kingdom, for example, releases an average 509m tonnes of carbon dioxide into the atmosphere every year, of which 205m tonnes result from the generation of electricity (Association for the Conservation of Energy, 1989). The destruction of biomass such as tropical rainforests, and forests elsewhere in the world, not only reduces the amount of carbon held in the terrestrial store but also, when burned, releases carbon dioxide to the atmosphere. Measurements of the carbon dioxide content of the lower atmosphere during the 20th century have revealed a general increase.

Increases from the current level of 350ppm 1. Status of carbon dioxide emission controls Extract from *Independent* Monday 29th October, 1990

## CARBON DIOXIDE TARGETS

Country	Target details	
<i>NO CONTROLS</i>		
US	Not in favour of emission controls despite a vague commitment by President Bush to stabilise at unspecified levels in Feb 1990	22.0
USSR	Not in favour of emission controls at present	18.4
<i>STABILISERS</i>		
JAPAN	Stabilise at 1990 levels by 2000	4.4
UK	Stabilise at 1990 levels by 2005	2.8
CANADA	Stabilise at 1990 levels by 2000 as a first step	2.0
ITALY	Stabilise at 1990 levels by 2000	
	Parliamentary resolution for 20% cut by 2005	1.8
BELGIUM	Stabilise at 1988 levels by 2000	0.5
AUSTRIA	Support stabilisation at 1990 levels by 2000.	
	20% cuts proposed by the environment minister	0.3
FINLAND	Stabilise at 1990 levels by 2000 at least	0.26
SWEDEN	Stabilise at 1988 levels by 2000	0.22
NORWAY	Stabilise at 1990 levels by 2000	0.22
SWITZERLAND	Has supported stabilisation at 1990 levels by 2000	0.2
IRELAND	Supported stabilisation at current levels by 2000	0.14
<i>REDUCERS</i>		
GERMANY	25% reduction on current levels by 2005. Agreed by cabinet but not yet ratified by parliament	3.2
AUSTRALIA	20% reduction by 2005	1.1
NETHERLANDS	Stabilise by 1995, 3% to 5% reduction by 2000	0.65
DENMARK	20% reduction by 2000, up to 50% by 2030	0.3
NEW ZEALAND	20% reduction by 2000	0.1

All EC member states except *UK* agreed overall Community stabilisation at current levels by 2000 at an informal meeting of Environment Council Ministers on September 23, under a formula which would allow Spain, Greece and Portugal initial CO<sub>2</sub> increases to a level in excess of 600ppm by AD2050 have been predicted.

However, our incomplete understanding of, for example, the role of the oceans, means that such a course of change is far from being a certainty. Of the observed increase, the majority can be attributed directly to the burning of fossil fuels and a relatively minor amount to deforestation (Rowntree, 1990). The analysis of Antarctic ice cores has suggested a strong correlation between air temperature and carbon dioxide so the implication is that current increases may lead to significant increases in temperature over the next 50-60 years (IPCC, 1990).

*Methane* is associated with the bacterial breakdown of organic matter and is temperature and moisture dependent. Typical natural sources include swamps and the digestive systems of animals. Anthropogenic sources include paddy fields and waste tips, which link methane production directly to the human population. These, in addition to inputs from cattle and leakage during fossil fuel extraction, have led to methane in the lower atmosphere increasing at a current rate of 1.0% per year. This gas is 30 times more effective than carbon dioxide as a greenhouse agent.

Anthropogenic *Nitrous Oxide* is a by-product of fertilizer manufacture and of fossil fuel and biomass burning. It is also emitted from vehicle exhausts. It is currently increasing at a rate of 0.4% per year.

*Ozone* in the lower atmosphere, as distinct from stratospheric ozone, results from the photochemical transformation of carbon monoxide, oxides of nitrogen, and hydrocarbons, which are emitted from vehicle exhausts. It is 2000 times more effective than carbon dioxide but has a relatively short lifespan in the atmosphere. The close association between road transport and economic development means that both ozone and nitrous oxides are likely to continue increasing, probably at accelerated rates.

*CFC's* 11 and 12 are essentially an industrial product, in the form of coolants in fridges and air conditioning systems, and propellants in aerosol cans, in addition to which they are used in the manufacture of plastic foams. Until recently there was an average 6.0% increase in atmospheric CFC's which are as much as 20,000 as effective as carbon dioxide as greenhouse agents.

The implication is that global temperatures will rise while the atmospheric content of greenhouse gases continues to increase. It is unlikely that the atmosphere has yet fully responded to current levels of these gases and their long lifespans means that even if their production were to cease tomorrow they would persist for many years to come. However, although we are aware of the physical properties of these gases, and of their proportional contribution to the gaseous mixture of the atmosphere, the link to global warming is not a matter of simply applying laboratory theory. The atmosphere and its interaction with the earth's surface are very complex and far from completely understood, added to which is the greenhouse effect of water vapour which can all too readily be understated. So, although there is obviously a bridge between the known behaviour of gases and the temperature of the lower atmosphere, it is by no means a firm structure and it should be crossed with care.

## THE EVIDENCE FOR CLIMATIC CHANGE

There is no shortage of circumstantial evidence that changes in climate are taking place. The examples used here illustrate the broad nature of trends in climatological variables which have been identified. Global mean temperatures derived from a large number of locations throughout the world indicate that since the late 19th century there has been an increase of approximately 0.5°C in which there have been two periods of greater warming, between 1900 and 1940, and the more recent dramatic temperature rise during the 1980's (Jones et al., 1988) culminating in the warmest year ever in 1990. Rainfall has followed trends which are regional, rather than global, in character. While annual rainfalls in subtropical latitudes have been decreasing since the 1950's, bringing drought to many areas, middle latitude locations such as the British Isles have experienced steady increases since the 1920's (Bradley et al., 1987). In this latter case, annual rainfall in western Scotland has shown particularly remarkable increases, approaching 50%, since the drier years of the early 1970's. Analysis of snowfalls in temperate latitudes has revealed a decrease in recent years, which has created particular problems for the skiing industry in Scotland. There is a body of opinion that the frequency of extreme events such as flood, drought, and storms have increased but the evidence here is not convincing. Mean sea-levels have been rising steadily since the end of the 19th century (Doornkamp, 1989) alongside increases in air temperature.

At first glance the evidence would appear to provide adequate proof of the existence of real long-term climatic changes. This does not, of course, imply that these are directly attributable to an enhanced greenhouse effect. The difficulty lies in testing whether there is a real, and scientifically valid, link between available theory and a set of observations which appear to fit, in some respects, with theoretically determined outcomes of global warming. In assessing the evidence it is important to bear the following in mind:

(a) the observations from which conclusions are drawn are subject to error. Global mean temperature, for example, are derived from a scatter of land-based weather stations. At each of these stations there is a potentially large cumulative observation error resulting from the calibration of the thermometer shelter to approved standards, and the character of the recording site. In this last respect, local topography and proximity to surface features such as urban areas or open water exert influences on recorded temperature for which there are no means of correcting to an established standard. At the end of the day, temperatures registered at any individual station are, at best, to within  $\pm 0.5^{\circ}\text{C}$ . This must be viewed alongside a trend in temperature which appears to suggest an increase of only 0.5°C over 100 years. Similar caution must be applied to sea-level data especially when one bears in mind that the relative levels of land and sea are subject to vertical movements in land masses.

(b) the span of the climatological record is very short. It is difficult to establish the nature of long-term changes in climate from less than 200 years of reliable records, bearing in mind that other forms of evidence for environmental change indicate change of the order of hundreds, if not thousands, of years.

(c) there is an ever-present and largely unknown background environmental variation. We don't know how climates would have evolved in the absence of human interference so it is impossible to gauge the magnitude of the anthropogenic component of change. For example, the observed warming could be simply a relaxation from the cold of the Little Ice Age of the mid-15th century to mid-19th century. On the other hand, global warming may be disguising a general cooling trend relating to ice-age cycles or other human influences on climate such as atmospheric dust levels.

(d) relationships within the environment involve not simple cause-effect linkages but complex causal networks of which we have, as yet, a very incomplete understanding. Principal amongst these are feedbacks, in which small changes may be compensated for within the operation of the earth-atmosphere system (negative feedback) or may result in a disproportionately large change (positive feedback). It is, therefore, very difficult to identify exactly why, for example, temperature has increased or rainfall decreased.

#### PREDICTING FUTURE CLIMATIC CHANGES

On the assumption that there is a reasonable degree of confidence in our data and in our understanding of the behaviour of environmental systems, the future course of climatic change has been predicted using a range of different modelling techniques. In doing so it must be borne in mind that such models are very imperfect creations of the human mind and should not be seen as anything more than crude approximations. As predictions progress forward in time so the degree of confidence in them diminishes. Models tend to be based on either energy balance approaches or the more complex global climatic models. As far as Scotland is concerned the various models appear to be indicating that by 2050 there will be an increase in mean temperature of approximately 2.0°C, and generally wetter winters and drier summers. One of the biggest problems is to predict what will happen to sea-levels, which should rise due to thermal expansion, plus melt water inputs from alpine glaciers and snowfields, the Greenland ice-cap and the Antarctic ice-sheets. The range of predicted increases in global mean sea-level is, as expected, very large but is most likely to be between 24 and 38cms (Warrick et.al., 1989).

The implications of such changes are considerable. There could be major changes in the distribution of agriculturally the greatest and least productive lands, severe threats not only to coastal communities such as in Bangladesh but also to industrial and sewage disposal plants, and an increased incidence of disease. Before we become unduly pessimistic, it is prudent to be aware of the limitations of our predictive models : —

(a) Because of limitations in both our understandings of the functioning of environmental systems and the computers used to run the predictive models, it is obviously necessary to use some degree of simplification. Thus the true complexity of vertical structures of, for example, the oceans can not be fully represented so an approximation using slabs or layers of finite depth is used. A similar approximation is used for the atmosphere.

A corollary of the above is that relatively coarse spatial resolutions are used, which are of the order of 1000km. This means that we can not differentiate between, for example, Scotland and southern England, or Argyll and East Lothian, despite the fact that we know these have markedly different climates.

There is, as yet, a very incomplete knowledge of the effect of oceans in climatic change. We know that they introduce a thermal lag because of their higher heat capacity, but insufficient is known of the exchanges of carbon dioxide across the air-sea interface. The role of marine biota is particularly problematical.

The response of polar ice-caps to changes in temperature remains uncertain. The simplistic statement that warmer air makes them melt is wholly inadequate, partly because of the exceptionally low temperatures, and partly because warmer air may result in more precipitation in the form of snow, thereby adding to the mass of ice.

Feedback processes are only partially understood and are certainly incompletely represented in predictive models.

However, although there remains much of uncertainty as to the exact course of future climatic changes, there is sufficient convergence in the models to suggest that global warming may be a reality and should be addressed as a potentially major environmental problem over the next few decades.

#### REDRESSING THE BALANCE

If we accept that the risks are real, there is clearly a need to engage in international dialogue to seek ways in which emissions of greenhouse gases can be reduced below critical environmental tolerance levels. For example, carbon dioxide emissions will have to be reduced by a little less than 60% to stabilise concentrations at present day levels (IPCC, 1990). A number of international conferences have taken place, best known of which have been the Montreal Protocol meetings and the 1990 Geneva conference on Climatic Change. At a second meeting of the Parties to the Montreal Protocol held in Britain in 1990 there was general agreement to phase out CFC's by 2000 with a cut of 50% by 1995 and 85% by 1997. Unfortunately agreement on other gases such as carbon dioxide is a more distant prospect. The uncertainties regarding the nature of feedback mechanisms in the carbon cycle and the role of the oceans, together with the close association between energy production and profitability in highly industrialised societies, have resulted in a wide range of responses to the perceived global warming problem (Table 1).

As far as the British public are concerned, there has been a noticeable increase in awareness of environmental problems and there has been a willingness to be more discerning in the choice of domestic products from the supermarket shelves; and the recycling of paper, glass and aluminium is now more widely accepted. However, the real problem of excessive energy use has not been addressed fully as this is perceived as having a direct impact on personal comfort and convenience. Energy conservation, including wider use of home

insulation and more efficient use of the ubiquitous car go a long way towards reducing the amount of greenhouse gases in the atmosphere. Now is also the time to consider alternative energy sources such as wind power.

## CONCLUSION

The not inconsiderable levels of uncertainty in the base data, the oversimplification of the complex environmental processes represented in predictive models, and the bandwagon element, together make it impossible to be certain about either the reality of ongoing global warming or climatic trends into the 21st century. We do not have to go too far back to recall an obsession with a forthcoming ice-age in the press of the 1970's. Perhaps global warming is just another passing fashion? To use a simple analogy, a sky full of clouds and a fresh westerly breeze in the morning are together sufficient indication that rainfall during the day is a real possibility, so we would be wise to take our umbrella with us. While we may return home at night with an unused umbrella we would also be protected should the rain materialise. Thus the signs are that real climatic changes may occur over the next few decades as a direct result of the addition of greenhouse gases to the atmosphere. We would be wise, therefore, to take steps to reduce emissions of these gases although at the end of the day the earth-atmosphere system may well be capable of absorbing them without generating major climatic changes.

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## THE WEATHER OF 1991

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University of  
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During 1991 rainfall and temperature were much closer to long-term averages than they have been in recent years. January started with gales and rain which were recurrent themes throughout the year. The River Allan flooded low-lying ground in Bridge of Allan on at least four occasions after a substantially lower frequency of floods since 1986, and gales posed problems throughout Scotland. In sharp contrast, fogs, which occur in calm and stable atmospheres, were more frequent than usual, and the first week of June saw widespread groundfrost with snow on the Scottish hills.

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

January. Generally cold and wet with snow mid-month.

The first ten days were very unsettled with strong to gale force winds and periods of very heavy rain and occasional sleet or snow. Winds over the first four days were between west and south-west and reached storm force on the 1st, which turned out to be the wettest day of 1991 (40.0mm). The rain became showery by the 2nd and was accompanied by thunder. A further 23mm of rain fell on the 5th. Snow fell in cold polar air early on the 7th and accumulated to a depth of 9 cms on low-lying ground. The snow cover froze then lingered until the 11th. By the 12th the snowline had retreated to above 35m on local hills but under clear night skies temperatures fell very sharply, dropping below -6.0°C every night between the 13th and 17th. Unsettled wet and windy weather returned on the 18th and the daytime temperature reached a pleasant 11.3°C on the 20th. However, the remaining days were dull with occasional light drizzle and fog and temperatures fell to just below freezing in the brief breaks in the cloud cover.

February. Cold at first with snow, becoming milder.

Light powdery snow fell intermittently between the 4th and 9th in an easterly wind but accumulations in Scotland were generally smaller than in England where heavy drifting snow on the 5th-7th brought widespread paralysis to road and rail. Cloud cleared on the 10th to give four bright sunny days with sharp night frosts and milder south-westerly winds cleared away the remaining snow after the 14th. Although night frosts persisted, the daytime temperature reached 10.7°C on the 15th. More unsettled weather returned to Scotland on the 19th and conditions remained wet and windy for the remainder of the month. Heavy sleet fell in a strong south-westerly breeze on the 22nd but this soon turned to rain. One of the most remarkable features of February 1991 was that night frosts were registered for the first 19 days without interruption.

March. Mild and damp after a cold start.

The weather was unsettled for much of the month with rainfall recorded on 20 days. The weather from the 3rd was dull with a persistent cloud cover and low cloud base. The 12th and 13th were exceptionally dull and wet days with poor visibility and steady drizzle. Heavy rain fell on the 18th which resulted in widespread flooding throughout Scotland. In parts of west Scotland over 50mm fell in less than 12 hours. However, after the 21st the next four days were bright with excellent visibility and slight night frosts. The cloud cover returned on the 29th but as this cleared away the 30th was a pleasantly warm and sunny day (16.3°C).

April. Unsettled at first, becoming cool.

The first nine days were windy with heavy showers, some of which fell as hail on the 3rd and there was almost continuous rain over the next four days, culminating in a 24hr fall of 24.5mm on the 12th. The skies cleared to give sunny warm spring days, reaching 18.0°C on the 15th but with local night frosts. Light rain fell late on the 20th but on the whole the weather remained dry and clear until the 23rd. As the skies cleared again night frosts returned briefly on the 27th and 28th.

May. Very dry but dull.

Over the first five days the wind was fresh north to north-easterly but the sky was rarely cloud-free and a few spots of light rain fell on the 3rd. However, there was no substantial rain until the 12th. The 21st to 28th were warm sunny early summer days exceeding 22.0°C on the 24th, 26th and 27th at Bridge of Allan. A fresh east to north-easterly breeze developed which, although dry, brought rather murky weather at the end of the month.

June. Cold and wet.

The winds were cold northerly and arctic over the first seven days so air temperatures were well below the seasonal normal and ground frosts were widespread. Small amounts of rain on the 2nd fell as snow on the hills. The cold weather ended on the 8th and remained unsettled with heavy rain at times until the 15th. The 48hr rainfall on the 8th-9th was 24.4mm. Showery weather gave way to heavy continuous rain mixed with hail on the 18th. The following nine days were again unsettled with only occasional sunny spells.

July. Warm but wet.

There was general rain over Britain on the 1st with thundery outbreaks but from the 3rd to the 7th the weather became drier and Stirling had the first spell of really warm summer weather, although cloud cover often persisted until mid-day. The temperature reached 24.5°C on the 4th. This was brought to an abrupt end by heavy rain on the 8th (10.4mm) which was accompanied by thunder and lightning. There was more rain on the 11th

and 12th and the weather continued to be generally damp. Heavy and prolonged rain fell on the 18th and 19th (24.5mm) after which there was a pleasantly warm interlude on the 21st. However, the respite was a brief one as rain returned late on the 22nd. The weather improved again after the 25th and temperatures exceeded 25.0°C on the 28th, 29th and 30th. However, mornings had a tendency to be cloudy and temperatures felt lower in a freshening easterly breeze.

August. Warm at times and reasonably dry.

There were three bright and sunny days at the beginning of the month but rain fell between the 4th and 6th. The weather continued unsettled with occasional rain although rainfall amounts were negligible. This persisted until the 24th when the rain moved away, but mornings were misty and dull, clearing only slowly to warm sunny afternoons. The temperature reached 26.6°C at Bridge of Allan on the 30th.

September. Settled at first, becoming wet and windy.

Dense fog on the mornings of the 1st - 4th cleared to give sunny warm days. The air became clearer and much cooler after the 9th and the first autumnal air-frost was registered on the 12th. The first rain of the month fell on the 13th and in the warm air the night-time temperature remained at an exceptional 15.0°C. The weather was unsettled with spells of mainly light rain and showers until the 20th. In a fresh to strong south-westerly wind 26.3mm of rain fell on the 21st, followed by a further 17.0mm on the 23rd, and winds reached gale-force overnight on the 23rd/24th. However, under clearing night skies, night frosts returned. A severe storm on the 27th fortunately by-passed Scotland but brought a northerly gale to the Irish Sea and very heavy rainfalls, in excess of 50mm, over southern England.

October. Cool and windy with occasional rain.

The wind reached strong to gale force west-south-west over the first three days and 32.8mm of rain had fallen by the 5th. There was a very mild run of air from the south-east on the 11th which deposited dust over England, reaching Scotland later in the day. The weather remained generally dull with a complete cover of low cloud but a westerly gale affected most of Britain on the 17th and 18th. Fresh northerly winds over Scotland then brought fresher weather with excellent visibility. As the winds dropped between the 23rd and 25th, dense fog formed in calm air, which tended to persist for most of the day. After the 26th the weather became dank and dismal in a southerly wind with low cloud and poor visibility, and rain returned on the 29th.

November. Very unsettled.

The first three days were relatively mild and wet but as winds freshened north-westerly there was a drop in night temperatures with air-frosts occurring on the 4th/5th (-0.5°C). During the late evening of the 8th there was a remarkable auroral display which began at approximately 20.00 and

persisted until well after midnight. There were two days of gales on the 10th and 11th and the 48hr rainfall total was 29.9mm. On the 12th and 13th heavy snow fell which was accompanied by thunder late on the 12th. In contrast, the 16th and 17th were cold foggy days (minimum  $-4.0^{\circ}\text{C}$ ,  $-4.7^{\circ}\text{C}$  at Bridge of Allan). There was a brief return to windy and wet conditions on the 18th but the weather was briefly brighter on the 19th with night frost. Moist and dull southerly winds dominated the weather for the remainder of the month. Winds varied between south-east and south-west and night-time temperatures remained above  $8.0^{\circ}\text{C}$  between the 21st and 24th.

December. Settled at first, becoming wet and windy.

The first eleven days were dull but when the clouds cleared late on the 2nd night temperatures fell below freezing, accompanied by dense fog on the 4th and 7th. Dense freezing fog persisted for most of the day on the 9th, 10th and 11th and the daytime maximum temperature on the 10th managed to reach only  $-3.4^{\circ}\text{C}$ . In the early hours of the 12th there was a remarkable increase in temperature and the morning weather observation was accompanied by the sound of melting ice dripping from the trees. The weather was dull and very damp and the minimum temperature fell to only  $7.3^{\circ}\text{C}$  at Bridge of Allan on the 14th. By the 17th continuous rain was falling, followed by squally showers with hail. Cold arctic winds affected Scotland from the 19th and heavy snow fell, which began to lie by the 20th and the odds on a white Christmas shortened quite dramatically!! Further snow fell in central Scotland on the 21st, eventually turning to drizzle by the afternoon. The month's wettest day was the 22nd (19.1mm) and the combination of melting hill snow and rain caused extensive flooding. Further sleet and snow fell briefly in cold arctic air before the weather became more settled for the remainder of the month. Christmas Day, as seems to be the pattern in recent years, was cloudy and wet in Scotland and the last day of 1992, like the first, was blustery and wet.

### The Gulf War

One of the major international events of 1991 was the Gulf War which began on January 15th and ended on February 28th during which time considerable concern was expressed regarding the effects the large number of oil-well fires could have on the atmosphere. While the local effects were severe, causing drastic reductions in incoming solar radiation and a general lowering of air temperatures, the effects further afield were, and still are, far less obvious. The smoke plumes comprised mainly soot particles which tend to settle from the lower atmosphere over relatively short distances. The upward thrust given to these particles by the heat from the burning wells was relatively small in comparison to, for example, a volcanic eruption, so they remained mostly within the lowest 3000m of the atmosphere. It was, therefore, unlikely that large amounts of soot were going to travel beyond 1000 km from Kuwait. Nevertheless soot did apparently fall on snowfields in the Himalayan range and there are those who would argue that the soot could have served to intensify Bay of Bengal typhoons. Whether or

not there has been any measureable effect on the Indian monsoon has yet to be established.

Reading:

Special issue of *Weather* 47(6) on "Gulf War Meteorology."

The February snowstorms.

As an anticyclone settled over Scandinavia on the 5th, where it remained until the 10th, the British Isles were brought into an extremely cold easterly airstream which had its origins in the continental interior of Siberia. The greatest impact was felt in southern and eastern England, which experienced severe cold and blizzard conditions. In such cold air, the snow tends to be 'dry' and is prone to drifting in strong winds. Snow fell to a depth of 30cms or so but accumulated in deep drifts in places. Visibility was reduced to less than 50m in blizzard conditions early on the 5th. In parts of south-east England this was the first substantial snowfall for 50 months, and 15cms fell in Guernsey which had its coldest February day for 43 years. Many rural communities were isolated for several days. Road transport was severely disrupted with speed restrictions on motorways, and many vehicles were abandoned. Most memorable, however, was the drastic effect on railway operations. The fine powdery snow was sucked into traction motors which then failed, and it also filled the runners under automatic doors which would no longer close. "The wrong sort of snow" for British Rail. When the general thaw came on the 14th insurance losses from both the snow and the accompanying freezing temperatures amounted to as much as £400 million.

Reading:

Brugge R 1991 The cold snap of February 1991 *Weather* 46 (8) 222 - 230

Volcanic Dust

The eruption of Mount Pinatuba in the Phillipines on the 16th June, one of the largest since Krakatao in 1883, threw millions of tons of dust into the stratosphere. Such is the nature of the circulation of the atmosphere that this dust will eventually have some measureable effect on most parts of the world, including central Scotland. Summer temperatures in the southern hemisphere, notably in Australia and New Zealand, have already been said to have been reduced by the dust veil. However, one of the visually dramatic effects of the dust occurs in the evening after sunset. There are accounts of remarkably red sunsets in the Stirling area during the 1890's following the Krakatao eruption so we should expect to see some colourful evening skies during 1992. The red/orange dust 'glow' tends to be best developed between 15 and 45 minutes after the sun has disappeared below the horizon.

### Dust fall in October

The British Isles experienced a warm south-easterly airstream on October 10th and 11th 1991 which originated over the Sahara Desert. Rain showers fell on the 11th which washed the dust out of the lower atmosphere in England during the day. This didn't reach Scotland until late evening (c23.30 GMT) when a few isolated spots of rain left a deposit which was most noticeable on parked cars. Such falls are not uncommon in southern England but are more rare in Scotland. The actual quantity of dustfall in Britain is usually relatively small but the very rare 'red rain' can deposit much larger amounts.

#### Reading:

Burt S 1991 Falls of dust within the British Isles *Weather* 46(11) 347 - 353

### Aurora Borealis

During 1991 there were at least two excellent auroral displays visible from central Scotland, on March 24th/25th and November 8th/9th. Although green-white colouration is the most common, other colours including blue and, in particular, red, appear in the strongest displays. The March display appears to have been seen only in Scotland and Northern Ireland but in November it was recorded as far south as Dorset and Norfolk. The author's own observations of the latter record that it lasted from the early evening (20.00 GMT) and persisted until well after midnight. Red colouration was dominant at its peak between 22.30 and 23.30.

#### Reading:

Irons P 1991 Observing the Aurora Borealis *COL Bulletin* No 251 30-33.

### Stirling University Climate Services

The automatic weather station which has been installed on the roof of the Cottrell Building at the University has begun to provide some real-time data on temperature, solar radiation, and wind speed and direction. Organisations, including schools, may be interested to know that a SUCS report is now available which lists the main suppliers of automatic weather monitoring systems and includes a check list to assist in systems purchasing.

Harrison S J 1991 Automatic weather monitoring systems: a brief guide. Report SUCS/01/91. (Available from the Editor for £3)

NOTE SUCS reports and services are now listed in the National Educational Resources Information Service (NERIS) database.

### Winter conditions

Recent SUCS research into winter in Scotland, with particular reference to road gritting and snow-clearing operations, has resulted in the development of an index of winter severity and a model of the spatial distribution of days with snow lying. Attention has focussed on recent changes in winter character and the

long-term effects of global warming on winter weather patterns.

The winter index has been based on the frequency of airfrosts and the number of days with snow lying at eight climatological stations in Scotland. The indications are that severity increased up to the late 1980's when winters suddenly became very mild. There is a significant correlation between the cost of winter road maintenance and the index values for Highland and Central Regions.

The simple distribution model of days with snow lie has been based on more than 60 climatological stations in Scotland. Input spatial variables are elevation, latitude and longitude. Two types of winter have been compared viz the 'typical' winter during which snowfalls are usually associated with continental easterly airstreams, and the 'mild' winter during which snowfalls tend to occur in westerly airstreams. The latter have been associated with changes in weather patterns linked to global warming so could be the more typical winter of the C21st. There are differences in the physical character of the snow in addition to modified distribution patterns, which shift the greatest snow risk from the east to the west coast.

#### Reading:

Harrison S J and Harrison D J 1991 Characterising winters: An index for use in applied meteorology *Journal of Meteorology* 16 329 - 333. Harrison S J Global warming and winter road maintenance Highways and Transportation (in press).

#### Ochil Hills: Carim Lodge

Observations at the weather station ceased during September 1991 after a considerable period during which the data obtained were less than satisfactory. The gradual deterioration in the monitoring equipment and the increasing frequency of missing records meant that closure of the station was the best option in the financial circumstances. The 10 years of data represent the only climatological record for the Ochil Hills and the closure leaves the area without any current weather monitoring. It is anticipated that the data will be published in due course and will certainly be used in the forthcoming 'Central Region' text being prepared by the Forth Naturalist and Historian.

#### Publications 1991

Harrison S J 1991 Automatic weather monitoring systems: A brief guide Report SUCS/01/91 University of Stirling.

Harrison S J and Harrison D J 1991 Characterising winters: An index for use in applied meteorology *Journal of Meteorology* 16 329 - 333.

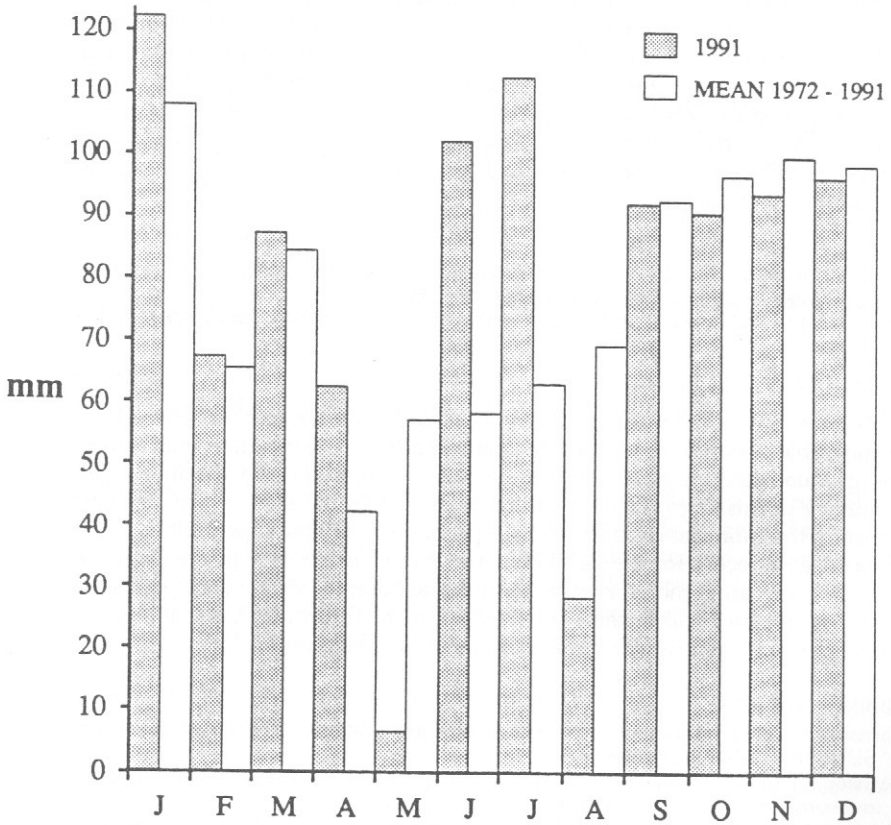
Harrison S J and Smith K 1991 Climatic Hazards Unit 1989-1990: Transfer to new consultancy services Report SUCS/05/91.

Smith K 1991 Recreation and tourism In: Parry M L (Ed) Potential Effects of ClimateChange in the United Kingdom HMSO London.

Smith K 1991 Environmental Hazards Routledge London.

Vale J A, Harrison S J and Watts C D 1991 Aerial inputs to the Severn Estuary: Final Reports WRc Reports DoE 2747-M, NR 2748. Medmenham.

These notes have been extracted from the Annual Climatological Bulletin No.13, copies of which can be obtained for £2.50 from Dr S. J. Harrison Department of Environmental Science, University of Stirling, FK9 4LA.



Monthly rainfall (precipitation) at Stirling (Parkhead) 1991 with mean 1978-91



## CHECK LIST OF THE BIRDS OF CENTRAL SCOTLAND

C.J. Henty and W.R.Brackenridge

Although there have been annual bird reports published for the area of the Forth centred on Stirling since 1974, there is no recent and comprehensive list of the birds of this locality. This list is intended to fill the gap and covers the Central Region, namely the administrative districts of Clackmannan, Stirling and Falkirk as of 1991. This area is more extensive than the bird recording area used by the Scottish Ornithologists' Club which does not include the Clyde drainage basin, part of which falls within Stirling District (Campsie Hills, Strathblane, the east shore of Loch Lomond and Glen Falloch). It is felt, however, that a basic list covering the whole Region would be useful for birdwatchers unfamiliar with the recording area and for people who need to work with local government boundaries. The historical sourcebook is Rintoul and Baxter's *Vertebrate Fauna of Forth* (1934) which follows a watershed boundary, broadly similar to the SOC recording area, but does not include the northern areas of Glen Dochart, Killin and Glen Lochay, which since the 1970's have been a part of Stirling District. The most recent general account of local birds is by D. M. Bryant in *The Stirling Region* (1974) and this also follows the less extensive watershed boundary. It is important to maintain comparability with these two detailed works and so in the following list we have made clear when comments apply only to the areas outside of the *Vertebrate Fauna* limits. The Forth estuary is referred to simply as 'the estuary'.

Due to changes in recording boundaries the existing information is scattered through a variety of Scottish and UK journals including the annual *Scottish Bird Reports* and at least five local bird reports. A lot of detailed information has not yet been fully analysed and in any case coverage of parts of the area is known to be patchy at best. Thus although we hope that no significant omissions or mistakes have been made it is likely that some records have been overlooked and we would appreciate being told about them. We are grateful to D. M. Bryant, C. McGuigan, J. Mitchell and R. E. Youngman for many helpful comments on earlier drafts, however the final judgements and errors remain the responsibility of the authors.

Emphasis is placed on breeding distribution except when a species is common at other seasons and rarely breeds. The occasional non-breeding in any quantitative way.

'Widespread' means that a species occurs over at least half the area whilst 'local' implies a few restricted localities. 'Abundant' is used in two contexts, for distributions where the species is widespread and over much of its habitat is seen repeatedly (eg, Chaffinch) and also for flocks when they commonly number several hundred. 'Frequent' is applied where a widespread species is normally seen during any excursion to its typical

habitat but only in small numbers and 'numerous' where flocks are commonly more than 10. 'Widespread' without qualification means that on a given excursion the species is hardly ever seen in numbers and often is not seen at all (eg Woodpeckers, Blackcap) and 'scarce' that it can be found at relatively few places or times.

'Irregular' indicates that a species has been recorded in less than five of the last ten years. 'Vagrant' means less than four records, the date of the last occurrence is mentioned and if there is only one record the date and place are quoted. The use of brackets round a species name means that we consider that the record(s) relate almost certainly to birds that have come from captivity. Many species occur in winter and also in spring and autumn, in this list the term 'winter' usually can be taken to include the other two seasons.

This list is meant to be a brief, handy guide. Comments have been mainly kept to single lines and can only give the broad features of occurrence, so many important details of local or seasonal distribution or yearly differences are intentionally omitted. Detailed notes on the present status of local birds can be found in the annual reports published in the *Forth Naturalist and Historian*. For the last twenty years the Scottish Ornithologists' Club has organised a systematic collection and appraisal of information on birds through a group of Local Recorders. The authors of this list are at present the Recorder and Deputy Recorder for this region and will welcome notes on the area's birds from resident and visiting birdwatchers. Rintoul and Baxter (1934) concluded that "The truth is that our Fauna is in a constant state of flux": this is certainly still true and only the constant effort of making observations can keep track of it.

BIRDS OF CENTRAL REGION - CHECK LIST

RED-THROATED DIVER	Very scarce, local in summer, widespread in winter
BLACK-THROATED DIVER	Very scarce, local in summer, irregular in winter
GREAT NORTHERN DIVER	Irregular winter visitor
GREAT CRESTED	Widespread breeding resident**
GREBE	Local breeder, abundant in winter on estuary
RED-NECKED GREBE	Scarce migrant
SLAVONIAN GREBE	Irregular winter visitor
BLACK-NECKED GREBE	Vagrant, last record 1972
FULMAR	Scarce migrant, mainly to estuary
MANX SHEARWATER	Irregular autumn migrant to estuary
STORM PETREL	Vagrant, last record 1946
LEACH'S PETREL	Vagrant, last record 1979
GANNET	Migrant, mainly to estuary
CORMORANT	Widespread non-breeding resident, numerous

SHAG	on estuary
(WHITE PELICAN)	Irregular winter visitor
BITTERN	Presumed escape, 4 on estuary May 1973
NIGHT HERON	Irregular, mainly winter visitor to Clydebasin
GREAT WHITE EGRET	Vagrant, last in May 1982
GREY HERON	Vagrant, 1 Loch Katrine May 1887
WHITE STORK	Widespread breeding resident
SPOONBILL	Vagrant, 1 Menteith & Loch Lomond 31 May 1982
(CHILEAN FLAMINGO)	Vagrant, last record 1973
MUTE SWAN	Irregular, presumed escapes
BEWICK'S SWAN	Widespread breeding resident
WHOOPER SWAN	Irregular winter visitor
BEAN GOOSE	Widespread winter visitor, locally numerous
PINK-FOOTED GOOSE	Winter visitor, local but often numerous
WHITE-FRONTED GOOSE	Widespread and abundant winter visitor
LESSER WHITE-FRONTED GOOSE	Scarce winter visitor, abundant Loch Lomond
GOOSE	Vagrant, 1 Cambus 20 January 1960
GREYLAG GOOSE	Numerous winter visitor, a few nest in the west
(BAR-HEADED GOOSE)	1 Loch Lomond 15 January 1978
SNOW GOOSE	Vagrant, last record 1991
CANADA GOOSE	Migrant, scarce and local breeder
BARNACLE GOOSE	Scarce winter visitor
BRENT GOOSE	Scarce winter visitor
SHELDUCK	abundant on estuary, local breederA
(MANDARIN DUCK)	Irregular, Clyde basin
(WOOD DUCK)	1 shot Fallin 2 October 1980
WIGEON	Abundant in winter, local breeder
AMERICAN WIGEON	Vagrant, 1 Clacks February and August 1992
GADWALL	Scarce migrant, has bred
TEAL	Abundant in winter, local breeder. Green-winged Teal, vagrant, 1 Stirling 19 February 1978
MALLARD	Widespread and abundant breeding resident
PINTAIL	Locally numerous winter visitor, has bred
GARGANEY	Irregular summer migrant
SHOVELER	Migrant, scarce and local breeder
POCHARD	Widespread and frequent winter visitor, rare breeder
RED-CRESTED POCHARD	Vagrant, 1 Gartmorn Dam 10 January 1988
TUFTED DUCK	Widespread breeding resident
SCAUP	Winter visitor, bred Loch Lomond 1987-89
EIDER	Visitor to estuary, through year but erratic
LONG-TAILED DUCK	Scarce winter visitor
COMMON SCOTER	Rare breeder Loch Lomond, elsewhere irregular
VELVET SCOTER	Vagrant, last record in 1988
GOLDENEYE	Widespread and numerous winter visitor
SMEW	Irregular winter visitor
RED-BREASTED MERGANSER	Numerous in winter on estuary, local breeder
GOOSANDER	Widespread in winter, local breeder

RUDDY DUCK	First recorded 1981, now local resident
HONEY BUZZARD	Vagrant, last in August 1990
RED KITE	Extinct breeder, last seen Loch Ard, summer 1917 Birds seen in 1990 presumably from RSPB release
WHITE-TAILED EAGLE	Vagrant, 1 shot Ben Lomond mid 19th century
MARSH HARRIER	Irregular migrant
HEN HARRIER	Local resident, widespread in winter
MONTAGU'S HARRIER	Bred 1952, 1953 and 1955
GOSHAWK	Vagrant
SPARROWHAWK	Widespread breeding resident
BUZZARD	Widespread breeding resident
ROUGH-LEGGED BUZZARD	Vagrant, last record 1980
GOLDEN EAGLE	Local breeding resident
OSPREY	Scarce summer migrant
KESTREL	Widespread breeding resident
RED-FOOTED FALCON	Vagrant, 1 Loch Lomond 17-19 May 1981
MERLIN	Local breeding resident
HOBBY	Vagrant, last record July 1989
PEREGRINE	Widespread but scarce breeding resident
GYRFALCON	Vagrant to Clydebasin, last record in November 1960
RED GROUSE	Widespread breeding resident on moorland
PTARMIGAN	Local breeding resident, on mountains
BLACK GROUSE	Local breeding resident
CAPERCAILLIE	Local breeding resident
(RED-LEGGED/CHUKAR PARTRIDGE)	Irregular, from released stock
GREY PARTRIDGE	Widespread breeding resident
QUAIL	Irregular migrant, probably has bred
PHEASANT	Widespread and numerous breeding resident
WATER RAIL	Scarce winter visitor, has bred
SPOTTED CRAKE	Irregular migrant mainly to Clydebasin
CORNCRAKE	Recently local breeder, now probably vagrant
MOORHEN	Widespread breeding resident
COOT	Rather local breeder, locally numerous in winter
OYSTERCATCHER	Widespread breeder*, abundant on estuary in winter
AVOCET	Vagrant, 1 Skinflats 13 January 1968
STONE CURLEW	Vagrant, 1 Strathblane August 1897
LITTLE RINGED PLOVER	Vagrant, attempted to breed 1987
RINGED PLOVER	Local breeding resident*
KILLDEER	Vagrant, 1 Bo'ness 16 January to 17 March 1983
DOTTEREL	Rare summer migrant, possibly breeds
AMERICAN GOLDEN PLOVER	Vagrant, 1 Kinneil 14-22 August 1977
GOLDEN PLOVER	Local breeder*, large flocks in winter
GREY PLOVER	Numerous autumn visitor to estuary, also winters
LAPWING	Widespread and frequent breeding resident*, abundant in winter
KNOT	Abundant winter visitor to estuary
SANDERLING	Scarce migrant
LITTLE STINT	Scarce migrant, occasionally numerous in autumn

TEMMINCK'S STINT	Irregular migrant mainly to Loch Lomond
PECTORAL SANDPIPER	Vagrant, last records in May and September 1987
CURLEW SANDPIPER	Scarce migrant, occasionally numerous in autumn
PURPLE SANDPIPER	Vagrant, last record in November 1987 at Lake of Menteith
DUNLIN	Abundant winter visitor to estuary, scarce breeder
BROAD-BILLED SANDPIPER	Vagrant, 1 Skinflats July 1967
RUFF	Scarce migrant, occasionally numerous in autumn
JACK SNIPE	Scarce winter visitor
SNIPE	Widespread breeding resident*
GREAT SNIPE	Vagrant, last record 1955
WOODCOCK	Widespread breeding resident
BLACK-TAILED GODWIT	Numerous on estuary, especially in autumn
BAR-TAILED GODWIT	Abundant winter visitor to estuary
WHIMBREL	Scarce migrant
CURLEW	Widespread and numerous breeding resident*
SPOTTED REDSHANK	Scarce migrant
REDSHANK	Widespread breeder*, numerous on estuary in winter
GREENSHANK	Migrant, scarce breeder in northwest, outwith Forth
GREEN SANDPIPER	Scarce migrant
WOOD SANDPIPER	Scarce migrant
COMMON SANDPIPER	Widespread breeding summer migrant
RED-NECKED PHALAROPE	Irregular migrant
GREY PFIALAROPE	Vagrant, last record in September 1991
TURNSTONE	Winter visitor to estuary
POMARINE SKUA	Scarce migrant to estuary
ARCTIC SKUA	Migrant, mainly to estuary
LONG-TAILED SKUA	Vagrant, 1 Trossachs October 1934
GREAT SKUA	Irregular migrant to estuary
LITTLE GULL	Irregular migrant
SABINE'S GULL	Vagrant, 1 Alloa 5 November 1955
BLACK-HEADED GULL	Local breeder, abundant in winter
COMMON GULL	Local breeder, abundant in winter
LESSER BLACK-BACKED GULL	Widespread summer visitor, local breeder
HERRING GULL	Abundant resident, no longer breeds
ICELAND GULL	Irregular winter visitor
GLAUCOUS GULL	Scarce winter visitor
GREAT BLACK-BACKED GULL	Widespread and frequent non-breeding resident
KITTIWAKE	Migrant, mainly autumn
GULL-BILLED TERN	Vagrant to estuary Sept 1969 & May 1977
CASPIAN TERN	Vagrant, Loch Lomond August 1968 & July 1976
SANDWICH TERN	Summer migrant, abundant on estuary in autumn
ROSEATE TERN	Irregular migrant to estuary
COMMON TERN	Local breeding summer migrant
ARCTIC TERN	Scarce migrant, bred Loch Lomond 1977 & 1978
SOOTY TERN	Vagrant, 1 Denny May 1939
LITTLE TERN	Irregular migrant to estuary
BLACK TERN	Scarce migrant
GUILLEMOT	Winter visitor mainly to estuary
RAZORBILL	Scarce winter visitor to estuary
BLACK GUILLEMOT	Vagrant, 1 Blackness 28 August 1983
LITTLE AUK	Irregular winter visitor to estuary
PUFFIN	Vagrant, last record 1970

PALLAS'S SAND GROUSE	Vagrant, last influx May - July 1888
FERAL ROCK DOVE	Widespread and frequent breeding resident
STOCK DOVE	Widespread breeding resident
WOODPIGEON	Widespread and abundant breeding resident
COLLARED DOVE	Widespread and frequent breeding resident
TURTLE DOVE	Vagrant, last record July 1987
CUCKOO	Widespread breeding summer visitor
BARN OWL	Local breeding resident, probably decreased recently
TAWNY OWL	Widespread breeding resident Local breeding resident
LONG-EARED OWL	Local breeding resident, widespread in winter
SHORT-EARED OWL	Vagrant, 1 Loch Lomond 1868
SNOWY OWL	Irregular summer migrant, used to breed
NIGHTJA	Widespread and frequent breeding summer visitor
SWIFT	Local breeding resident
KINGFISHER	Vagrant, last record in April 1984
HOOPOE	Vagrant, last record in October 1988
WRYNECK	Widespread breeding resident
GREEN WOODPECKER	Widespread breeding resident
GREAT SPOTTED WOODPECKER	Vagrant, reported Loch Ard 1968 and 1970
LESSER SPOTTED WOODPECKER	Widespread breeding resident*, often abundant
SKYLARK	Widespread and frequent breeding summer visitor
SANDMARTIN	Widespread and frequent breeding summer visitor
SWALLOW	Widespread and frequent breeding summer visitor
HOUSE MARTIN	Widespread and frequent breeding summer visitor
TREE PIPIT	Widespread resident, breeds abundantly in hills**
MEADOW PIPIT	Winter visitor to estuary
ROCK PIPIT	Scarce summer migrant, used to breed
YELLOW WAGTAIL	Widespread breeding resident**
GREY WAGTAIL	Widespread and frequent breeding resident,
PIED WAGTAIL	White Wagtail, scarce migrant
WAXWING	Widespread but irregular winter visitor
DIPPER	Widespread breeding resident
WREN	Widespread and abundant breeding resident
DUNNOCK	Widespread and abundant breeding resident
ROBIN	Widespread and abundant breeding resident
NIGHTINGALE	Vagrant, 1 Stirling 14 May to 22 July 1952
BLUETHROAT	Vagrant 1 Gr'mouth May 1980 and Str'blane June 1983)
BLACK REDSTART	Vagrant, last record in January 1983
REDSTART	Widespread breeding summer visitor
WHINCHAT	Widespread and frequent breeding summer visitor
STONECHAT	Local breeding resident
WHEATEAR	Widespread and frequent breeding summer visitor
DESERT WHEATEAR	Vagrant, 1 Alloa 26 November 1880
RING OUZEL	Widespread but scarce breeding summer visitor
BLACKBIRD	Widespread and abundant breeding resident
FIELDFARE	Widespread and abundant winter visitor
SONG THRUSH	Widespread and abundant breeding resident
REDWING	Widespread and abundant winter visitor
MISTLE THRUSH	Widespread breeding resident
GRASSHOPPER WARBLER	Scarce breeding summer visitor

SEDGE WARBLER	Widespread breeding summer visitor
LESSER WHITETHROAT	Vagrant, last record in April 1988
WHITETHROAT	Widespread breeding summer visitor
GARDEN WARBLER	Widespread breeding summer visitor
BLACKCAP	Widespread breeding summer visitor
YELLOW-BROWED WARBLER	Vagrant, 1 Buchlyvie 6 November 1960
WOOD WARBLER	Widespread breeding summer visitor
CHIFFCHAFF	Widespread breeding summer visitor
WILLOW WARBLER	Widespread and abundant breeding summer visitor
GOLDCREST	Widespread breeding resident
SPOTTED FLYCATCHER	Widespread breeding summer visitor
PIED FLYCATCHER	Local breeding summer visitor
LONG-TAILED TIT	Widespread breeding resident
CRESTED TIT	Vagrant, 1 near Stirling 21 February 1981
WILLOW TIT	Once breeding resident, now irregular Clydebasin
COAL TIT	Widespread and frequent breeding resident
BLUE TIT	Widespread and abundant breeding resident
GREAT TIT	Widespread and abundant breeding resident
NUTHATCH	Vagrant, 1 Loch Lomond 18 March 1968
TREECREEPER	Widespread breeding resident
GOLDEN ORIOLE	Irregular migrant
RED-BACKED SHRIKE	Vagrant, last record in May 1989
GREAT GREY SHRIKE	Irregular winter visitor
JAY	Widespread breeding resident
MAGPIE	Widespread and frequent breeding resident
CHOUGH	Long extinct breeding resident
JACKDAW	Widespread and numerous breeding resident
ROOK	Widespread and abundant breeding resident
CARRION CROW	Widespread and frequent breeding resident, Hooded Crows and hybrids in the north-western part of Stirling District
RAVEN	Local breeding resident
STARLING	Widespread and abundant breeding resident
HOUSE SPARROW	Widespread and numerous breeding resident
TREE SPARROW	Widespread but rather scarce breeding resident
CHAFFINCH	Widespread and abundant breeding resident
BRAMBLING	Widespread but erratic winter visitor
GREENFINCH	Widespread and frequent breeding resident
GOLDFINCH	Widespread breeding resident
SISKIN	Widespread breeding resident in Stirling District, generally widespread and numerous in winter
LINNET	Widespread and numerous breeding resident
TWITE	Local breeding resident, widespread in winter
REDPOLL	Widespread breeding resident
TWO-BARRED CROSSBILL	Vagrant, 2 Carron Valley 14 October 1985 to 1986
COMMON CROSSBILL	Local breeding resident and erratic visitor
BULLFINCH	Widespread breeding resident
HAWFINCH	Very scarce and local breeding resident
LAPLAND BUNTING	Irregular migrant and winter visitor
SNOW BUNTING	Widespread winter visitor, occasionally numerous on hills
YELLOWHAMMER	Widespread and numerous breeding resident

REED BUNTING (RED-HEADED BUNTING)	Widespread breeding resident 1 Dunblane June 1974
CORN BUNTING	Local breeding resident, decreasing

Note a short (pp3-5) lively comment on the decline in birds and habitats over the last 50 years is given by local naturalist, hillman Dick Bernard, in his latest book *In Quiet Places*, Clacks District Libraries

## BOOK REVIEW

**Robert Louis Stevenson and the Highlands and Islands of Scotland.** Louis Stott. Creag Darach Publications, Milton-of-Aberfoyle, 1992. vi, 154 pages. £7.50. ISBN 1-874585-01-6.

Stevenson is a well-known and well-loved figure. Many of his works, from *Kidnapped* to *Weir of Hermiston*, are "a good read" as well as being substantial and subtle literary achievements. Stevenson also attracts much interest through his pleasantly Bohemian personality, and through the romantic appeal of his wandering life and early death.

At home in France, in California, in the South Seas, and even in England, Stevenson was nevertheless always and everywhere deeply attached to his native Scotland. Like Sir Walter Scott in this as in other ways, it would be fair to say that Stevenson's deepest roots lie in and around Edinburgh: and in Stevenson's case the Pentlands are of particular significance. However, as Louis Stott demonstrates, Scotland north of the Highland Line is also very much Stevenson country.

A sense of place - be it Samoa or the island of Erraid - is particularly important in Stevenson's works; and Louis Stott provides an interesting chapter on "The Literary Topography of *Kidnapped*". Another valuable feature of Stott's book is an Appendix entitled "On the Trail of Stevenson in the Highlands". With its supporting maps and photographs, this section will greatly enhance the enjoyment of many a tourist in the north of Scotland. This attractive and well-produced book will give its readers much pleasure.

Douglas Mack



**FORTH AREA BIRD REPORT 1991**

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This report is compiled from a larger archive of records submitted to the local recorder under the national scheme organised by the Scottish Ornithologists Club. 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 winter and early spring were largely unsettled with wet and windy conditions except for a short, sharp cold spell in mid January and a long period of night frost in early and mid February. Early April was wet and there was much floodwater, even though the rest of spring was average in temperature many summer migrants arrived late whilst Swallow numbers were down and their breeding season was very late. The summer was notable for a cold and wet June which caused considerable losses in the downy young of waders and ducks in Strathallan. From late September to the end of the year the weather resumed its unsettled state with much rain although there was frost and fog in early December.

Possibly the most significant event of the year was the first proved breeding of Ruddy Duck, though the expansion of this introduced species may be a mixed blessing as far as other breeding wildfowl are concerned. In the first half of the year Crossbills were still frequent after the 1990 influx and it is suspected they bred in Clackmannan. Numbers of Blacktailed Godwits have been consistently high around Grangemouth whilst at the end of the year there was a distinct influx of Waxwings.

For many species the records sent in are very unrepresentative of their general distribution; this applies particularly to very common species or to those that are secretive or breed in inaccessible places. In the past I have asked readers to consult Thorn's *Birds in Scotland* or the Atlases of breeding or wintering birds to put the records in context but it would clearly be more convenient to give more direct indications. So in this report I have put, after the species name, a coded summary of general distribution according to this scheme:

*B* - Breeding status, widespread (in more than five 10 km squares)

*b* - " " , local, scarce (in fewer than five 10 km squares)

*W* - Winter status, widespread or often in groups of more than ten.

*w* - " " , local, scarce (local and usually fewer than ten in a group)

*P* - Passage (used when species is usually absent in winter, *P* or *p* used for widespread or local as in winter status).

*S* or *s* - a few species are present in summer but do not normally breed. Thus *BW* would be appropriate for Robin, *B* for Swallow, *p* for Ruff and *SW* for Herring Gull. No status letter is used if a species occurs less than every

other year. An asterisk (\*) in front of the species name means that all records received have been quoted.

For several species of waders and duck more information has been received than can be sensibly reported in full detail. In these cases I have mentioned the more striking individual records and summarised the rest for each half-month as the minimum number of birds that can reasonably account for the records, this means adding up the maximum numbers recorded for what I take to be distinct localities. These "area summaries" clearly have limitations, underestimating when an important locality has not been visited and overestimating if the same flock has been reported from two places that I have assumed to be separate; however, this is the best way of giving a more systematic description of the seasonal pattern of occurrence.

The following abbreviations have been used: AoT - apparently occupied territory, c/n - clutch of n eggs, CP - Country Park, GP - gravel pit, Imm - immature, L. - Loch, NR - Nature Reserve, Res - Reservoir, WG - Wildlife Garden, Y - young.

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I am glad to acknowledge the help given by Bill Brackenridge, the Deputy Local Recorder. We are entirely dependent on local observers writing down and sending in their observations, more contributions are most welcome and should be sent to: C J Henty (SOC bird recorder), Edgehill East, 7 Coneyhill Rd, Bridge of Allan, Stirling FK9 4EL. (Tel 0786 832166). We should also be pleased to give advice on the location and identification of birds or other bird-watching queries.

\* 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 *Cavia stellata* (b,w)

4 on Forth estuary 16 January (DMB)

F 1 Kinneil 24 March (DT).

SWP Loch E: Pair had 2 eggs on 24 July and one new hatched chick on 14 August, disappeared by 6 September. 1 at Loch A 22 August (MT).

\*BLACK-THROATED DIVER *Gavia arctica* (b)

SWP 2 Loch A 29 March, 3 on 9 April, 1 on 14 June, 2 on 15 July. Pair raised 1 young on Loch F (MT).

LITTLE GREBE *Tachybaptus ruficollis* (B,w)

- C 10 pairs Gartmorn; on 9 July broods of 4,3,2,2,1 (MC). Pair Cowden pond 9 June (S&AN). Winter records: 2 Castlehill Res 14 January, on Devon 2 at Alva 7 January & 1-3 Harviestoun 9 January to 13 February (S&AN).
- S 5 pairs Airthrey, 15 young fledged - 2 double brooded and 1 failure; first of spring 3 on 14 March, 17 still present 15 October, 1 on 18 December (MVB). SWP 3 L.Lubnaig 3 February; 6 L.Lubhair 14 October & 9 November (WRB DT). 2 L.Watson 7 July (CJH). 1 Doune Ponds March - early April (WRB).

GREAT CRESTED GREBE *Podiceps ctistatus* (b,W)

- F Kinneil: 320 on 13 January, 560 on 10 February, 47 on 24 March, 38 on 21 July, 98 on 4 August & 305 on 24th, 185 on 8 September & 200 on 22nd (MVB DMB DT). 24 Skinflats 14 February (MVB). 6 Bo'ness 22 August (PWS).
- C 2 pairs Gartmorn, 1 nest predated by Coot, the other washed away by high wind (MC).
- S 1 Carron Valley Res 1 December (DT).
- SWP 5 Lake of Menteith 25 March, 3 pairs on 1 June (WRB DT). 1 L.Watson 26 May & 7 July (CJH). Pair Blairdrummond Lake 31 August (PWS).

\*FULMAR *Fulmarus glacialis* (p)

- F 1 Kinneil 1 May, 30 June (RS DT), 2 over Grangemouth 12 August (WRB).

\*MANX SHEARWATER *Puffinus puffinus*

- F 1 Grangemouth 10 September (GO).

\*GANNET *Sula bassana* (p)

- F 15 Kinneil & 2 Skinflats 7 September; 3 Skinflats on 12th & 1 on 15th, all juveniles (DMB MVB). C 1 Cambus 22 September (DMB).

CORMORANT *Phalacrocorax carbo* (S,W)

- 14 on Forth estuary 16 January (DMB).
- F 549 Skinflats on 16 January, 105 on 14 February & 138 on 5 December (MVB). 20 Kinneil 24 March (DT).
- C 80 S.Alloa 3 January, 90 on 9 November (WRB CJH).
- S 14 on Forth at Cornton 20 January, 7 Manorneuk 15 February (CJH DT).
- SWP 17 Lake of Menteith 24 March & 16 on 28th, 9 on 26 April (RB MVB DT). On Teith at Callander max 3 on 15 January, 2 (juveniles) stayed to end February; 2 returned 18 November, max 4 on 29th (1 adult) (Mrs A Anderson). 1 Lecropt 8 December. 2 Castlehill Resvr 28 March (BH). 1 Keltic Water (Callander) 25 December (SS).

GREY HERON *Ardea cinerea* (B,W)

- F Skinflats: 14 on 16 January, 11 on 22 August, 13 on 8 September & 14 on 9th (MVB CJH). SVVP 15 adults at heronry Lake of Menteith 10 March (RB).

MUTE SWAN *Cygnus olor* (B, W)

- C Pairs reared 5 young at Gartmorn, 7 at Cambus, 6 at Delph Pool. 19 Gartmorn 9 November (MC BRT).
- S Pair hatched 9 & reared 7 at Airthrey (MVB). SWP Pair Doune Ponds, L.Watson, Blairdrummond GP (5 juveniles 24 August), 1 Castlehill Res 6 March & pair with 1 juv 5 November (BH CJH).

WHOOPEE SWAN *Cygnus cygnus* (W)

- F 12 Skinflats 18 October (GO).
- C 12 Cambus 27 October (CJH). 17 Gartmorn 9 November, 6 adults & 4 juv on 27th, 17 on 17 December (AC MC S&AN).
- S 4 L.Laggan 27 January, 2 on 1 December (DT). 6 over Bridge of Allan 28 September (JC) - early date.
- SWP L. Lubnaig: 24 (8 juv) on 24 January, 11 adults on 9 November (G M Adam DT). 23 L.Dochart 10 March; 8 L.Lubnaig 3 February & 3 on 16 November (CJH DT). 4 L.Chon 3 & 6 March & 5 on 21st. 8 Lake of Menteith 28 March (DT). 27 (with 4 Mute Swans) Blairdrummond 29 January (MT). Drip Moss: 24 + 20 on 5 January & 27 on 13th; 34 on 17 February; 29 + 51 on 3 March, 106 on 24 th (10 imm; 3 with yellow leg rings) & 42 on 29th; 52 on 6 April, 45 on 12th & 0 on 15th. 22 Kippen 3 January; 11 Thornhill on 17 February, 51 on 7 November & 22 on 26 November (MVB HD SS MT). 21 Lecroft 5 December & 31 on 7th (MVB). 9 L.Katrine 2 December then 4 to Xmas (MT).

BEAN GOOSE *Anser fabalis* (w).

- F 147 Slamannan 6 January & 125 L.Elrig 15 January. 40 ->SE Slamannan 10 September, 22 Shortrig Moss 23 September & 20 on 4 October; 88 Carron Valley Res 13 October, 15 Slamannan on 18th & 45 L.Elrig on 27th. This group is now only occasionally at Carron Valley Res or L.Elrig, the major haunt is in Strathclyde around Cumbernauld - Hillend Loch (JGS).

PINK-FOOTED GOOSE *Anser brachyrhynchus* (W)

- Total for Forth Valley 5400 on 10 February and 5516 on 23 March (MVB)
- F 300 -S Kinneil 10 February (DT). 100 Grangemouth 9 November (
- C 3500 Tullibody Inch 21 April. 120 + 150 -> E at Gartmorn 29 September (MC). 57 - E at 15.30 Tullibody Inch 9 November (CJH).
- S Stirling: 100 -> E 13 April, 100 -> N 3 May. Heard on evening of 10 September & 28 ->S on 28th, 100 -> W on 1 December (RJ DT).

SWP 1200 Lecropt 12 February (WRB), 500 Lecropt 13-14 February (BH).  
 300 Blairdrummond 22 February and 2000 on 10 March; 400  
 Arnprior 16 March (DT). 2000 Drip Moss 24 March (HD). Dawn  
 departure from roost at Lake of Menteith: 2094 on 10 February  
 (mainly toward Arnprior), 686 on 24 March (probably landed by L  
 Macanrie). 150 feeding Gartartan and 50 Mailing 10 March (RAB).  
 3 L.Katrine 29 May (MT). 60^ N Aberfoyle 26 April and 40 -" N on  
 28th (CJH). (N movement at Inver-snaid, Clyde, 23 April and 5 May,  
 MT). 1000 Lecropt 20 November (DT), 300 on 8 December (BH), 800  
 on 21st (WRB) and 3090 on 23rd (MVB).

\*WHITE-FRONTED GOOSE *Anser albifrons (w)*

C 1 (Greenland race) Gartmorn 3-5 & 25 November (AC MC).  
 S 2 (Greenland race) with Greylags Gargunock 27 March (RB).

GREYLAG GOOSE *Anser anser (b, W)*

Generally low numbers in Forth valley January-February, 850 on 3  
 March (MVB). Movement N at Inversnaid (Clyde) 15-22 April (MT).  
 1030 in Forth valley on 10 November (MVB).

S 600 Kippen 27 January, 170 Gargunock 10 March (DT).  
 C 480 Gartmorn 12 October & 400 on 25th, 187 on 3 November &  
 1500 on 17 December & 132 on 27th (AC MC). 17 — S Glendevon at  
 10.20 5 November (CJH). 455 Clackmannan 5 December (DMB). 1  
 Cambus Pool 14 July (CJH).

SWP 22 at roost Lake of Menteith 10 February (RB).

\*SNOW GOOSE *Anser caerulescens*

F 11 Skinflats 24 September (A McIver, per RS).

\*CANADA GOOSE *Branta canadensis (b)*

F 1 Airth 24 September (KG).-

SWP Pair with 4 small goslings L.Watson 26 May (CJH).

\*BARNACLE GOOSE *Branta leucopsis (w)*

F 8 Skinflats (Stonehouse Farm) 6 October (GO).

SWP 1 Lecropt 9 & 14 February (MVB BH).

SHELDUCK *Tadorna tadorna (b, W) F*

4025 Kinneil 7 August & 4200 on 24th (DMB). 531 Skinflats 14  
 February & 527 on 5 December (MVB).

C 250 Tullibody Inch 15 September & 90 on 9 November (CJH). 19  
 Cambus 14 November, 12 on 30th (BRT).

WIGEON *Anas penelope (b, W)*

1113 Forth estuary 5 December (DMB).

F 140 Kinneil 13 January & 200 on 20th, 120 on 10 February; 120 on  
 31 December (RS DT). 95 Skinflats 16 January (MVB). 300 Higgins  
 Neuk 13 February (PWS).

C 17 Cambus pool 2 September (CJH). 1300 Gartmorn 27 December

- (MC).
- S 2 Airthrey 2 September, 3 on 13 October (DMB MVB). 16 N.Third Res 15 November (WRB).
- SWP 30 Lake of Menteith 21 February. 20 Lubnaig 9 November (DT).
- \*GADWALL *Anas strepera* (p)
- C Pair Gartmorn 24 April, 24 September & 3 November, 1 on 3 September & 3 (2 Males) 27 November (DMB MC).
- TEAL *Anas crecca* (B, W)
- 1220 Forth estuary 16 January (DMB).
- F 400 Kinneil 13 January & 100 on 22 September (DT). 203 Skinflats 14 February . 670 Grangemouth 16 January, autumn numbers low -120 on 12 September & 156 on 5 December (MVB).
- C 10 on Devon at Harviestoun 7 February (S&AN). 4 Cambus 2 August and 13 on 5th. 50 Tullibody Inch 15 September & 30 on 9 November (CJH). 112 Gartmorn 3 November (MC).
- S 40 Cambuskenneth 10 February & 43 on 15th (CJH). SWP 4 (3 Males) L.Dubh, Torrie, 14 April (DT).
- MALLARD *Anas platyrhynchos* (B, W)
- 1712 Forth estuary 16 January (DMB).
- F 797 Skinflats 16 January & 394 on 12 September (MVB).
- C 4 broods Cambus Pool (WRB). 800 Gartmorn on 27 December (MC). 70 Harviestoun 18 November (S&AN).
- S 510 Airthrey 17 January & 551 on 10 September; 28 pairs - of 34 broods 20 were total failures & only 60 fledged from the rest, a poor breeding season (MVB). 105 N.Third Res 20 January (WRB). 47 Cambuskenneth 15 February & 85 L.Laggan 3 March (MVB CJH). SWP 5 broods Doune Ponds (WRB). 40 Frandy Res 5 November (CJH). 30 on Forth at Gargunnock 10 February (S&AN).
- PINTAIL *Anas acuta* (W)
- F Skinflats: max 72 on 16th January decreasing to 22 on 17 March, 7 on 19 April. 8 on 6 October, 42 on 5 December & 85 on 26th (MVB DMB GO). Kinneil: max 9 on 9th & 14 April; 13 on 22 September, 16 on 5th December (MD KG GO RS DT). Pair Manor Powis 15 February (CJH), pair Gartmorn 3 November (MC).
- Area summary: Jan Feb Mar Apr ~~~ Sept Oct Nov Dec  
64 72 51 41 53 26 9 7 ~~~ 6 13 8 6 2 - 88 85
- SHOVELER *Anas clypeata* (p)
- 2 Skinflats 19 April (GO). 5 Kinneil 4 August , 3 on 9 October; 2 Grangemouth 7 October (KG DT). Male Cambus Pool 23 June (WRB), 2 on 4 August & 1 on 27th, 1 on 15 September (DMB CJH). Gartmorn: Female present July, 1 on 3 September & 4 (1 Male) on 24th (DMB MC).

POCHARD *Aythya ferina* (W)

- F 13 Kinneil 22 September (DT).  
 C 4 Cambus pool 24 July (CJH). 90 Gartmorn 3 November (MC).  
 SWP 19 L.Lubnaig 3 February & 20 Lake of Menteith on 21st (DT). 3 on  
 floods Drip Moss 14 April (S&AN). 1 L.Watson 7 July (CJH).

TUFTED DUCK *Aythya fuligula* (B, W)

- F 14 Skinflats 14 February (MVB).  
 C 244 Gartmorn 27 December (MC). 2 Cambus pool 17 August  
 (CJH).  
 S Airthrey: 14 pairs, 8 broods with 54 ducklings but only 19  
 fledged, later broods with poor survival probably due to algal  
 bloom; max 52 on 18 February & 74 on 18 December (MVB). 10  
 L.Lubnaig 3 February & 20 Lake of Menteith on 21st (DT). 4  
 L.Watson 26 May & 10 on 7 July, 76 Blairdrummond GP 24  
 August & 100 on 31st (CJH PWS). Pair Ashfield in summer  
 (WRB).

SCAUP *Aythya marila* (w)

- F Kinneil: 13 on 10 February & 30 on 18 March, Male on 12 May; 3  
 on 26 October, 18 on 16 November (DMB MD DT).  
 C Female Gartmorn 27 November (MC).  
 SWP Male L.Watson 5 & 26 May (DMB CJH).

\*EIDER *Somateria mollissima* (w/p)

- F 12 (3 Males) Kinneil 12 May & 1 on 8 September (DMB DT).

\*LONG-TAILED DUCK *Clangula hyemalis* (w)

- F 1 Grangemouth 16 January (MVB), 2 on 17 October (KG).

\*VELVET SCOTER *Melanitta fusca*

- F 1 Kinneil 24 November (MD KG).

GOLDENEYE *Bucephala dangula* (W)

- 276 Forth estuary 14 February (DMB)  
 F 8 Skinflats 16 January & 9 on 5 December (MVB).  
 C 1 Cambus 30 August & 3 September, 10 on 30 November, 17 (5 ad  
 Male) on 15 December (DMB CJH BRT). 46 Gartmorn 27 December (MC).  
 S 80(30 Males) on Forth at Cambuskenneth 14 January, 40 on 10  
 February & 121 Blackgrange-Cambuskenneth on 15th (CJH PWS).  
 1 juvenile Airthrey 14 August (MVB). SWP 10 Lecropt 20 January,  
 11 on floods Drip Moss 14 April (DT S&A N). 1 Blairdrummond  
 GP 24 August (CJH).

\*SMEW *Mergus albellus* (w)

- C 1 redhead Gartmorn 19 November to 17 December (AC MC)

S&AN RS).

RED-BREASTED MERGANSER *Meigis serrator* (B/W)

215 Forth estuary 16 January (DMB).

- F Skinflats: 123 on 16 January, 78 on 14 February; 22 on 5 December (MVB). S 3 Cambuskenneth 10 February (CJH). SWP Female with 8 young, R.Teith at Lecropt 25 June (PWS).

GOOSANDER *Mergus merganser* (B, W)

- F 3 Skinflats 14 February & 12 September (MVB). 5(1Male) on R.Avon at Polmont 10 February (JW).

- C R.Devon: Pair or Female Alva- Dollar 3 January- 10 February; Female giving distraction display Crook of Devon 8 May; 5 F/imm Vicar's Bridge 27 June, Cauldron Linn 13 September & Dunning Bridge on 26th; 5 (1 Male) Dollar on 19 September (S&AN).

- S 6 L.Laggan 27 January (DT). 14 North Third Res 17 February, 6 on Forth at Cambuskenneth on 10th and 6 Blackgrange- Cambuskenneth on 15th (WRB CJH PWS). SWP 5 L.Dochart 10 March. 11 (2 Males) Castlehill Res 14 January & 8 (4 Males) on 5 November (CJH S&AN). 2 Females Frandy Res 5 November (CJH).

\*RUDDY DUCK *Oxyura jamaicensis* (b)

- SWP L.Watston: Pair 5 May & 4 (1 Male) on 26th; 3(1 Male) on 7 July & 5 adults + 1 duckling on 29 August (DMB CJH). This is the first evidence of breeding in the area (Ed).

\*MARSH HARRIER *Circus aeruginosus* (p)

- SWP Female Kinbuck 6 July (WRB).

\*HEN HARRIER *Circus cyaneus* (b?,W)

- S Male Dumyat 13 February & 1 on 18 September (DMB WRB). 1 -\* S Airthrey 26 August (DMB).

- SWP Male L.Rusky 16 March (DT). Female Braes of Doune 27 March; 1 Invertrossachs 15 September, 1 Aberfoyle 20 November (MT), 2 Callander (E Brackland) 30 October (WRB). Female Thornhill 24 November & Male on 9 November & 24 December (SS). 1 Sheriffmuir 13 October (CJH). 1 Glen Dochart 18 August (REY). NB: There has been no information available on breeding status for a number of years (Ed).

SPARROWHAWK *Accipiter nisus* (B, W)

- F 1 Jupiter WG (Grangemouth) 8 November (WRB).

- C 1 in garden Menstrie 14 November & 31 December (BRT). Bred Woodhill, Birkhill, Harviestoun, Vicars Bridge (MC).

- S 3 Displaying Carron Valley Forest 24 March, 1 Plean CP 17 March (DT).



SWP Pair Torrie Forest 13 April (DT).

BUZZARD *Buteo buteo* (B, W)

- C Bred Harviestoun, pair AoT Birkhill (MC). 2 Vicars Bridge 24 April, around Dollar 13 July to 8 November, max 3 on 9 September (CJH S&AN).
- S 1 Gargunock 23/24 July (S&AN). 1 Dumyat 13 February (WRB). 2 Airthrey 8 April, 1 -> S on 4 November (DMB MVB). 1 - N Stirling 18 September (DT).
- SWP L.Ard Forest AoTs at Doon Hill, Balleich, Duchray, Menteith Hills (CJH). 4 Callander 14 March, 8 Torrie Forest 14 April (DT), 4 Doune 21 April & pair on 1 June (WRB PWS). 1 AoT Keir, bred Kippenrait (MVB CJH). 1 Wharry Burn 1 February & 28 October (CJH S&AN). 3 Glendevon 8 May (DMB).  
Autumn-winter records in same areas, max 4 Callander 4 & 7 September 6 4 Keir on 9th (DMB MVB CJH PWS DT). One Blairdrummond bird was very pale and may have given rise to suspicions of a Rough-legged Buzzard around Keir in the late autumn (Ed).

GOLDEN EAGLE *Aquila chrysaetos* (b,w)

7 sites checked, 5 occupied by pairs (1 immature); only 1 young reared,  
1 pair probably robbed of eggs and one of young (PSA). Pair present  
Loch G, pair Loch D reared 2 young (MT).

OSPREY *Pandion haliaetus* (p)

- SWP First in spring 22 April (DT), 2 over Doune 28 August & 1 -> SW Callendar 7 September (CJH).

KESTREL *Falco tinnunculus* (B,W)

- C Pair reared 3Y Alva Glen, 2 pairs reared 5Y Woodhill (MC). 1 Menstrie 14 November, perched on lamppost by main road, swooped down to village green (BRT).

\*MERLIN *Falco columbarius* (b?,W)

- F 1 Kinneil 10 February & 3 November (RS DT). 1 Skinflats 10 November (DMB).
- S 1 Bridge of Allan 21 January, 1 Cambuskenneth 15 February (CJH). 1 Stirling 28 September (DT). 1 Airthrey 12 October (DMB). SWP 1 Blairdrummond Moss 22 September (DT).  
NB: No information on breeding status for some years (Ed).

PEREGRINE FaJco *peregrinus* (B, W)

At 30 sites there were pairs at 24 and 3 single birds; 15 successful pairs reared 25 young, also one c/3 deserted and young vanished from another (JM PSA).

- F Kinneil: 1 imm on 8 September, 2 on 30 November & 1 on 5

- December, 1 Grangemouth 16 December (WRB KG S&AN DT). 1 Skinflats 14 February, 12 September, 5 December (MVB).
- C Dollar: 1 stooped at Sparrowhawk on 3 February, 2 chasing Woodpigeons on 10th (S&AN). 1 Manor Powis 11 August (DT).
- S 1 Bridge of Allan 21 January (CJH).
- SWP 1 Callander 30 January (WRB). 1 L.Mahaick 9 November (SS).
- RED GROUSE *Lagopus lagopus* (B, W)
- S covey of 15 Kippen Muir 1 December (DT).
- SWP Only a few broods seen Braes of Doune 6 July (WRB).
- BLACK GROUSE *Tetrao tetrix* (B, W)
- SWP 3 (2 Males) Menteith Hills 3 April (DT). 8 Kilmahog 14 March, 10 Males Keltic Water (Callander) on 30 October & 6 Males on 25 December (WRB MC PWS SS). 6 Males at lek E Ochils February-early May (MC). 4 Males Frandy Res 5 November (CJH).
- \*CAPERCAILLIE *Tetrao urogallus* (b,w)
- SWP Male L.Ard Forest 28 July & 4 August, probably feeding on blaeberrries (CJH).
- GREY PARTRIDGE *Perdix perdix* (B, W)
- C 6 Alva 5 October (S&AN).
- S 12 Bandeath 5 August (PWS).
- SWP 8 Lecropt 8 February (PWS). 16 at 540m Innerdownie 18 August (MC).
- \*WATER RAIL *Rallus aquaticus* (w)
- F 1 Kinneil 9 & 11 February, 2 September (MD RS).
- S 1 Airthrey 1 December (CJH).
- MOORHEN *Gallinula chloropus* (B,W)
- C 5 Tullibody Inch (tidal marsh) 9 November (CJH).
- S Airthrey: 56 on 14 January & 62 on 10 September; 18 pairs (8 double brooded) - 52 young fledged, 47 by the 11 pairs not affected by Mink predation, so a good season in spite of Mink (MVB).
- COOT *Fulica atra* (B, W)
- C 28 pairs & 48 non-breeders Gartmorn, 740 on 27 December (MC). 4 pairs Cambus Pool, broods of 2,2 & 3 on 14 July (WRB CJH).
- S Airthrey: Spring fighting began 23 January (S&AN). 98 on 18 February & 88 on 18 December; 24 pairs fledged 49 young, early season but only 1 double brooded (MVB).
- SWP 174 Lake of Menteith 21 February (DT). 10 L.Watson 25 May (CJH).

OYSTERCATCHER *Haematopus ostralegus* (B, W)

Forth estuary 974 on 12 September (DMB).

F 50 Skinflats 14 February & 48 on 12 September (MVB).

C First heard at night Menstrie 20 February, 1 on floods at Alva on 28th (BRT CJH).

F First heard at night: Stirling & Bridge of Allan 24 February (CJH DT). 1 Craigforth 6 January, 25 on 21 February, 200 on 27th & 150 on 5 March (WRB DT). 2 Airthrey 28 February, on University roof 20 March and present to end June (presumably bred) (MVB CJH).

SWP 101 Lake of Menteith 10 March, 98 L. Watston on 23rd, 80 Blairdrummond 29 March & 62 on 14 April (RAB DT S&AN PWS). 85 Blairdrummond GP 25 July (CJH).

KINGED PLOVER *Charadrius hiaticula* (b,W)

Forth estuary: 89 on 5 December (DMB).

F 14 Kinneil on 18 August & 20 on 22nd, 15 Grangemouth 7 September (DMB CJH DT).

\*DOTTEREL *Charadrius morinellus*

C 1 Ben Cleuch 18 August, also a second bird heard calling (MC) - also seen and photographed by two hillwalkers who kindly showed the print to the editor who has mislaid their names.

GOLDEN PLOVER *Pluvialis apricaria* (B,W)

887 Forth estuary 5 December (DMB).

F 273 Skinflats on 16 January & 285 on 14 February (MVB). 200 Kinneil 2 January, 30 on 5 September & 100 on 16 November (CJH)

DT). C 23 Tullibody Inch 15 September (CJH). Heard Ben Cleuch 24 May (S&AN).

S 102 Kippen 26 April - northern type (DT). SWP 6 Glenoglehead 26 April (PWS). 1 Uamh Beag 30 October - late bird (WRB). 50 Thornhill 21 December (SS).

GREY PLOVER *Pluvialis squatarola* (W)

F 12 Airth 24 September (KG), 65 Skinflats 12 October (DMB).

LAPWING *Vanellus vanellus* (B, W)

5013 Forth estuary 5 December (DMB).

F Kinneil: 300 on 2 January, 250 on 4 August, 400 on 16 November (DT). Skinflats: 326 on 16 January, 237 on 22 August & 890 on 5 December (MVB CJH). 800 Higgins Neuk 26 July & 400 on 22 August (CJH).

S 800 Cambuskenneth & 600 Bandedeath 5 August, 1000 Dunmore 25

September, 2000 Bandeath 25 September & 4 October (PWS).

- C 900 Tullibody Inch 30 July, 260 on 9 November (CJH).  
 SWP Spring return: 2 Lake of Menteith 10 March (RAB).

KNOT *Calidris canutus* (W)

650 Forth estuary 16 January (DMB). F Kinneil: 1000 on 2 January; 15 on 16 July, 40 on 5 September, 1500 on 16 November (DMB CJH RS DT). Skinflats: 2000 on 16 January, 1920 on 4 February; 625 on 5 December (MVB).

- C 1 Cambus 10 & 11 August (WRB CJH), 1 Tullibody Inch 15 September (DMB) - scarce on estuary above Airth (Ed).

\*SANDERLING *Calidris alba*

- F 1 Kinneil 24 August (DMB).

\*LITTLE STINT *Calidris minuta* (p)

- F 1 (adult) Kinneil 14 July, 1 on 8 September & 1 on 7 October (KG RS ni).  
 1 Grangeburn 10 September (GO).

\*CURLEW SANDPIPER *Calidris ferruginea* (p)

F Kinneil: 3 on 24 August, 2 on 5 September, 4 on 6th, 6 on 7th & 22nd; 4 on 7 October, 2 on 9th & 5 on 10th (DMB CJH KG DT). 2 Grangemouth on 8 September & lion 12th (MVB). Skinflats: 5 on 24 August, 1 on 7 September, 9 on 11th, 4 on 22nd (DMB GO).

- C 8 Tullibody Inch 15 September (DMB CJH).

Area summary: Aug Sep Oct  
 - 8 34 10 5 -

DUNLIN *Calidris alpina* (b?, W)

5150 Forth estuary 16 January (DMB).

- F Skinflats: 2150 on 16 January, 4380 on 14 February, 153 on 12 September, 3320 on 5 December (MVB). 600 Dunmore 25 September (PWS).

\*RUFF *Philomachus pugnax* (p)

F 1 Skinflats 21 April, 1 on 15 July & on 24 & 27 September (DMB GO). 1 Kinneil 2 August, 5 on 4th & 10 on 24th, 1 on 27 September, 1 on 10 October (DMB KG RS). 2 Kincardine Bridge 5 August & Ion 18 September (DMB KG).

- C 6 Cambus & 6 Tullibody Inch 15 September (DMB CJH).

Area summary: Apr Jul Aug Sep Oct  
 - 1 1 - 7 10 6 3 1 -

\*JACK SNIFE *Lymnocyptes minimus* (w)

F Kinneil: 2 on 2 & 13 January, 5 on 12th & 3 on 29th, 10 on 9 February, 20 on 10th & 8 on 11th & 13th (CMcG RS DT); 12 on 19 October & 3 November, 1 on 7 & 16 November & 4 on 20th, 2 on 20 December & 8 on 31st (MD KG RS DT). 1 Jupiter WG 8 November & 17 December (WRB). 1 Airth 17 October (KG).

SWP 1 Doune Ponds 27 January (WRB). 1 Thornhill 24 November (SS).

Area summary:     Jan   Feb   Oct    Nov   Dec  
                       5   4   20 - - 13   13 5   9

SNIPE *Gallinago gallinago* (B,W)

F    Kinneil: max 26 on 29 January, 41 on 9 February; 7 on 30 August rising to 71 on 20 November (CJH RS DT). 5 by M9 at Grangemouth 2 January (JW). Max 8 Jupiter WG 23 December (WRB). C    9 Alva 7 January (S&AN). Cambus: 10 on 2 August, 15 on 4th & 16 on 25th, 12 on 2 September (DMB CJH).

WOODCOCK *Scolopax rusticola* (B, W)

S    1 Airthrey 17 January & 2 (in rhododendron) on 31st. 2 Dollar 3 February & 1 on 1 November (S&AN).

S    Resident in North Third Woods, brood of 3 small young seen on 3 June, adult flew off 50m with one of them grasped between the legs (AJD). 2 Carron Valley Forest 27 November & 1 Kippenrait on 28th (CJH). 1 Kippen Muir 1 December (DT).

SWP 1 Torrie Forest 19 November (CJH). (certainly greatly under-recorded in breeding season, Ed)

BLACK-TAILED GODWIT *Limosa limosa* (W)

F    High numbers at Kinneil from 58 on 5 September to 62 on 20 December.  
           Jan   Feb   Mar   Apr   May   Jun   Jul   Aug   Sep   Oct   Nov

Dec

Kinneil 15 18 20 12 - 18 25 - 24 4 2 - 4 2 8 36 58 6 54 52 60 30 36  
 62

Skinflats - 1    --    --    2 29 1 - - - - - 14 8 12 8 - - - - -  
 4

Also: Carron Mouth: 1 on 24 Jan, 7 on 14 Sep, 4 on 26 Dec; 4 R.Avon mouth 4 Aug. There seems to have been a stable flock through the early winter to early May with a switch from Kinneil to Skinflats in late April. Few were present from late May to early August but there was then an increase to a September peak (when birds occurred higher up the estuary) that was sustained to the end of year, apparent declines in the middles of September, October and December are probably due to birds temporarily using another part of the estuary. Compiled from notes of: DMB WRB MVB MD KG CJH CMcG GO PWS RS DT. C 2 Cambus 10 & 11 August, 4 Tullibody Inch 15 Sept (DMB WRB CJH).

BAR-TAILED GODWIT *Limosa lapponica* (W)

268 Forth estuary 14 February (DMB).

F    Kinneil: 50 on 2 January, 200 on 10 February, 120 on 24 March; 1 on 18 August, 100 on 16 November (DT).

\*WHIMBREL *Numenius phaeopus* (p)

F    Kinneil: 1 on 1 May, 6 June, 8 & 16 July; 2 on 15 & 20 July, 3 on 17th

& 4 on 21st, 1 on 24 August & 4 September (DMB GO RS).  
 Skinflats: 1 on 26 May, 21 July, 2,4,17&23 August, 3 on 6 August. 1  
 over Grangemouth 23 July, 3 Airth 24 August (WRB DMB KG  
 GO RS).

C 1 Cambus Pool 23 May (MC).

Area summary:    May     Jun     Jul     Aug    Sep  
                          1 2     1 -     3 4    3 5    1 -

CURLEW *Numenius arquata* (B, W)

1376 Forth estuary 12 September (DMB).

F 350 Kinneil 21 July (DT), 150 on 20 August (CJH). 322  
 Grangemouth 16 January, 399 on 12 September (MVB).

C 75 Tullibody Inch 30 July & 1 August, 55 on 9 November (CJH).  
 SWP spring return: 3 Ashfield 6 March (1 pair prob bred), 24 Lake  
 of Menteith on 10th (RAB WRB). 10+ pairs Kilbryde-Bows (WRB).  
 First return SW over Dunblane on 16 June, many breeding  
 failures due to bad weather (MVB).

SPOTTED REDSHANK *Tringa erythropus* (p)

F Kinneil: 1 on 6 January, 9 to 23 February, 3 March, 14 April, 1  
 May, 4 July, 31 August, 1 on 2&8 September, 2 on 7th & 22nd; 3  
 on 2 October & 4 on 6th then 1 to 30th (DMB MVB GO KG RS).  
 Skinflats: 1 on 31 August, 11 September, 13 September (GO). 1  
 Grangemouth 12 September (MVB).

REDSHANK *Tringa totanus* (B, W)

3436 Forth estuary 12 September (DMB)

F Kinneil: 550 on 24 March, 120 on 21 July, 450 on 4 & 18 August,  
 526 on 20th & 895 on 22nd, 520 on 5 September & 860 on 8th  
 (CJH DT). Skinflats: 480 on 16 January, 996 on 14 February, 269 on  
 12 September 6 613 on 5 December (MVB).

SWP 1st Lake of Menteith 10 March (RAB). 3 pairs Blairdrummond 29  
 March (PWS).

GREENSHANK *Tringa nebularia* (p)

F Kinneil: 1 on 14 April, 2 on 4 May; in autumn from 8 July to 27  
 September, max 3 on last date. Skinflats: from 21 July to 27  
 September, max 9 on 7 August; 1 Airth 27 September (DMB  
 MD KG CJH GO RS DT).

Area summary    Apr    May    Jun    Jul    Aug    Sep  
                          1 - 2 -    - -    2 5    10 6    4 6

\* GREEN SANDPIPER *Tringa ochropus* (p)

F Kinneil: 1 on 2 & 4 August and 2 & 9 September. Skinflats: 1  
 from 1 to 24 August with 2 on 4th (MD KG CJH GO RS). C 1  
 Cambus pool 31 May (MC), 1 Devonmouth 14 July (CJH). SWP 1  
 Barbush 5 August (DMB).

\*WOOD SANDPIPER *Tringa glareola* (p)

F 1 Skinflats 1 August (GO).

C 1 Cambus pool 31 May (MC), 1 on 2 August (CJH).

COMMON SANDPIPER *Tringa hypoleucos* (B)

F 15 Kinneil 10 July &amp; 11 on 21st, 1 on 22 August (CJH RS DT).

C First Dollar 21 April (S&amp;AN), 2 on 3 May (DMB). 2 Cambus-Tullibody Inch 24 July - 1 August (CJH).

TURNSTONE *Arenaria interpres* (W)

69 Forth estuary 16 January (DMB).

F 1 Kinneil 2 January, 2 on 17 July, 1 on 16 November (RS DT).

\*GREY PHALAROPE *Phalaropus fulicarius*

C 1 Tullibody Inch 15 September - a very restless bird that, unexpectedly, spent its time walking and feeding on the mudflat (DMB JC CJH).

\*POMARINE SKUA *Stercorarius pomarinus* (p)

F 2 adults Grangemouth 10 September (GO), 1 immature -&gt; W 30 October (KG).

\*ARCTIC SKUA *Stercorarius parasiticus* (p)

F 1 Kinneil 6 September &amp; 13 -\* W on 7th (DMB), 2 probables on 8th (DT), 1 Grangemouth on 10th (GO).

\*LITTLE GULL *Larus minutus*

F 1 adult Skinflats 21 July (GO), 1 immature -&gt; SW (inland) 22 August (CJH).

BLACK-HEADED GULL *Larus ridibundus* (B, W)

F 840 Skinflats 8 September (CJH).

S Parties flycatching presumably for ants) Bridge of Allan 30 August, sultry evening (CJH).

SWP 600 Argaty GP 5 May, 100-200 nests (DMB). 120 pairs Ashfield, about 50 young reared (WRB).

COMMON GULL *Larus canus* (B, W)

SWP 5 displaying L. Watston 16 May (CJH). 50 Argaty GP 5 May, 2 nests (DMB). 100 Upper Glendevon Res, 55 apparently incubating, 23 May, plus 3 more at W end (S&amp;AN).

LESSER BLACK-BACKED GULL *Larus fuscus* (S, w)

F 1 Skinflats 9 January (DMB).

S 2 Airthrey 14 March (DMB), 1 Stirling 7 January &amp; 18 December (WRB DT - still scarce in midwinter, Ed).

SWP 1 Lake of Menteith 21 February &amp; 70 at roost 10 March (RAB DT). 40 Blairdrummond GP 24 August (CJH).

HERRING GULL *Larus argentatus* (S,W)

800 Fallin tip 24 July & 4200 on 15 December (CJH).

\*ICELAND GULL *Larus glaucoides*

S 1 (1st winter) Little Denny Res 21 December (RMcG).

\*KITTIWAKE *Rissa tridactyla* (P,w)

F 1 Kinneil 2 January (DT). 1 in field by Avon 10 February (JW). 120  
- W Skinflats 19 April (GO).

SANDWICH TERN *Sterna sandvicensis* (P)

F 10 Kinneil 8 September (DT), 50 Kincardine Bridge 23 August  
(DMB).

C 7 Cambus 2 September & 10 on 5th (DMB CJH).

COMMON TERN *Sterna himmudo* (B)

F 92 incubating Grangemouth Docks 16 June (DMB).

\*BLACK TERN *Chlidonias niger*

F Adult in breeding plumage Skinflats 13 June (GO RS).

GUILLEMOT *Uria aalge* (W)

F 70 Skinflats 16 January (MVB).

ROCK DOVE/FERAL PIGEON *Columba livia* (B,W)

F 140 Skinflats 8 September (CJH).

C 160 Longcarse 15 September (CJH).

STOCK DOVE *Columba oenas* (B, W)

F 1, in group of 3, buffeted by immature Peregrine, but escaped,  
at Kinneil 8 September DT).

C In breeding season at Alva, Dollar . 20 Alva 5 October (S&AN).

S In breeding season at Mine Wood, Abbey Craig, Plean CP. 11  
Sheriffmuir 1 February (CJH S&AN DT).

WOODPIGEON *Columba palumbus* (B, W)

S Feeding under beech trees Airthrey and Mine Wood in January,  
max flock 80. 1000 in brassicas Cambuskenneth 10 February  
(CJH). 190 in 5 flocks -\* W Airthrey 5 November (S&AN).

COLLARED DOVE *Streptopelia decaocto* (B, W)

C 16 Menstrie 26 December, max 11 feeding on grain in garden  
that month (BRT - reports of flocks of more than 20 are scarce,  
possibly round farms but overlooked, Ed).



CUCKOO *Cuculus canorus* (B) F

1 Kinneil 21 May & 2 on 23rd (RS).

- C,S Recorded in breeding season Silver Glen, Pendreich (MC CJH). SWP First Menteith Hills 2 May (DT), Glendevon 10 May (DMB S&AN). Late adult L.Katrine 21 August (RJ).

BARN OWL *Tyto alba* (b,w)

- S In early April 1 at Sheriffmuir and 1 dead on road at Buchlyvie (WRB). SWP Pair reared 3 young Aberfoyle. 1 Ward Toll 23 February (MT)

TAWNY OWL *Strix aluco* (B,W)

- C Pair reared 3 young Woodhill (MC). Calling at 3 sites Dollar (S&AN).  
S Reported Abbey Craig, Airthrey (S&AN).  
SWP Seen Fairy Knowe 22 May & Doon Hill 29 June (CJH). In Trossachs pairs excluded from nest boxes due to occupation by Grey Squirrels (HR).

LONG-EARED OWL *Asio us* (b,w)

- F 1 Kinneil 19 & 30 October & 3 & 7 November (MD KG RS).  
S Pair reared at least 2 young Sheriffmuir (MC). SWP 1 Aberfoyle 10 November, found by road with broken wing (MT).

SHORT-EARED OWL *Asio flammeus*

- F 4 Grangemouth 16 January (MVB). 2 Dunmore 25 January (PWS). Max at Kinneil 8 on 6 January & 5 on 9th, 5 on 11 February; 1 on 14 August, 19 October, 3 November, 3 on 4 December (MD KG S&AN RS DT).  
C 1 Tullibody Inch 6 February (PWS). Good breeding E Ochils, at 2 nests (out of 5 pairs located) 1 reared 4 & another 5 young (MC).  
S 1 L.Coulter 15 November (WRB). SWP 1 Cromlix 6 July (WRB).

SWIFT *Apus apus* (B)

- C First Dollar 23 May, parties of 18 & 40 on 24 July, last on 13 August (S&AN).  
S First Bridge of Allan 11 May, around nesting site on 17th; screaming parties of 40 from 16 July to 2 August, max 140 on 24 July, last 28 on 16 August & 18 over R.Teith on 17th (DMB CJH). First Stirling 24 May, last 2 -> S on 22 August (RJ DT). SWP First Dunblane 16 May (MVB). 120 Loch Ard Forest 28 July, 1 on 12 & 16 August (CJH).

KINGFISHER *Alcedo atthis* (b,w)

- F 1 Grangemouth 22 & 23 March (JW). 1 Airth 19 September (KG). 1 Kinneil 16 November (DT). C 2 pairs each fledged 1 young (MC). 1 on Devon at Dollar 3 & 11 February, Crook of Devon 16 September & 10 October (S&AN). 1 juvenile killed by Sparrowhawk Cambus

- pool 13 August (MC).  
 S 1 Airthrey 31 January, 14 March; 10 records 26 September - 4 December (DMB MVB KG). 2 Bridge of Allan 14 April (JC). SWP 1 on Teith at Lecropt 17 August (CJH) - fisherman reported had bred close by.

GREEN WOODPECKER *Picus viridis* (B,W)

- C 4 pairs Woodhill (MC). Juveniles seen Dollar, Blairlogie July-August (S&AN).  
 S Seen in breeding season Plean CP, Mine Wood (calling from 4 March) (CJH PWS DT). 1 in garden Causewayhead 22 December (JLB).  
 SWP In breeding season at Edinchip (Lochearnhead), Kilmahog, Torrie Forest, Port of Menteith, Loch Ard Forest (RAB CJH PWS DT).

GREAT SPOTTED WOODPECKER *Dendrocopos major* (B, W)

- F 1 Kinneil House 4 February & 1 Skinflats on 14th (RS). 1 on telegraph pole Polmont 23 June (JW).  
 C Nest with chicks (in live Oak at 3m) Dollar 2 June, fledged on 14th (S&AN).  
 S 2 pairs Mine Wood, 1 Airthrey (CJH). Nest Abbey Craig 11 June, fledged by 18th (S&AN). S  
 WP 3 pairs Doon Hill-Fairy Knowe (CJH).

SKYLARK *Alauda arvensis* (B,W) F 2

- F 20 Skinflats 14 February (MVB). 100 Kinneil 13 January & 250 on 10 February (snow), 1 released having flown into polythene bag whilst foraging amongst weeds (DT).  
 S Singing Kippen Muir 21 February (DT).  
 SWP 200 Blairdrummond Moss 10 February (S&AN). 80 Lecropt 21 December (MVB). Still frequent Sheriffmuir 9 October (CJH).

SANDMARTIN *Riparia riparia* (B)

- S 20 Airthrey on 17 April (First of spring, DMB).  
 SWP 1 Crianlarich 16 March (DMB), 5 Dunblane 31 March (WRB). 413 nests Barbush in June (M Alves).

SWALLOW *Himndo rustica* (B)

- Over 14 farms a decrease of 35% in breeding pairs, also a very late season (DMB).  
 C Numerous by 29 April, last Dollar 21 October (S&AN). First Menstrie 10 May (BRT). S 1 Airthrey 20 & 25 April, Kippen 1 May (DMB KG RJ). Last at Bridge of Allan 6 on 2 October, 1 Airthrey on 7th (MVB CJH). SWP First L.Ruskie 26 April (DT). 2-3 pairs Ashfield, few reports before late May (WRB).

HOUSE MARTIN *Delichon urbica* (B)

- C First Menstrie 10 May (BRT). 50 Dollar on 14 August, still 20 on 29 September (S&AN).
- S 1 Airthrey 17 April (DMB), last 15 on 7 October (MVB). First Bridge of Allan 2 May (JC). Nest building Stirling from 26 May (RJ).
- SWP Very late at Dunblane - 4 on 8 June (MVB). 1 Ashfield 16 May, 6 pairs by 27 May (WRB). 10 nests E Bracklinn 30 August (PWS).

TREE PIPIT *Anthus trivialis* (B)

- C 2 Muckhart 8 May (DMB). AoT/pairs at: Craigleith, Wood Hill (4), Carnaughton (2), Dollar Glen (3), Maiden's Well (MC S&AN).
- SWP 1 Menteith Hills 26 April (DT). 3 AoT Doon Hill-Fairy Knowe from 8 May (CJH).

MEADOW PIPIT *Anthus pratensis* (B,W)

Winter records:

- C 19 Alva 7 January (S&AN). 12 Cambus 12 Novemebr (BRT).
- S 17 Millhall 8 February (DT).
- SWP Still frequent Sheriffmuir 9 October (CJH).

\*ROCK PIPIT *Anthus petrosus* (w)

- F 2 Kinneil 2 January (DT). 1 Dunmore 25 January (PWS).

GREY WAGTAIL *Motacilla dnerea* (B,w)

- F Bred Grangemouth - juvenile being fed 23 June (JW).
- C midwinter: 1 Menstrie 1 December (BRT).
- S midwinter: 1 Bridge of Allan 21 January (CJH).
- SWP Poor breeding success Trossachs (HR). Pair Ashfield (WRB).

PIED WAGTAIL *Motacilla alba* (B,W)

- S 13 Bridge of Allan 19 January & 15 on 21st (CJH). 40 Stirling Cattle Market 10 October (CJH). No comments on breeding status (Ed).

\*WAXWING *Bombycilla garrulus* (w/W)

- F 5 Falkirk (eating berries) 8 January (JW). 34 Bo'ness 3 February (RS).
- S 8 Stirling 28 January (G Waley), 20 on 15 December (AJD). 15 Bridge of Allan 26 November, feeding on attached, overripe
- SWP 50 - W L. Arklet 27 November (MT).

DIPPER *Cinclus cinclus* (B,W)

- F 1 wintered in overflow channel Grangemouth 11 to 25 February (JW).
- S 4 wintering Bridge of Allan 7 December (CJH).
- SWP Fair breeding season Trossachs (HR).

ROBIN *Erithacus rubecula* (B,W)

S 4 disputing around fruit trees at Stirling 26 September (RJ).

\*BLUETHROAT *Lusdnia svedca*

F Female at Kinneil 22 May (GO RS) - 2nd record for area (Ed).

REDSTART *Phoenicurus phoenicurus* (B)

C Pair reared 5 young Woodhill (MC).

SWP 7 At Doon Hill-Fairy Knowe, first 8 May, main arrival by 19th (CJH). At Trossachs nestbox site 26 attempts raised 149 young (HR).

WHINCHAT *Saxkola torquata* (B)

F First of spring: 1 Skinflats 14 April (GO). Migrants: 2 Grangemouth 7 August, 1 on 22 September (DMB).

C 3 pairs Burn of Sorrow, Dollar, 2 Harviestoun, (MC). SWP 2 pairs Upper Glendevon Res 23 May; 3 pairs in 2 km east of Frandy (S&AN).

\*STONECHAT *Saxicola torquata* (b,w)

SWP Female with 3 juveniles S. Queich 27 July; Male Frandy 11 October (S&AN). Pair bred on SE side of Beinn Uamha, Queen Elizabeth Forest Park (RAB).

WHEATEAR *Oenanthe oenanthe* (B)

F First migrant: 5 males Kinneil 9 April (GO), last 1 on 22 September (DT).

C First, male Craigleith on 2 May (S&AN).

S Pair Dumyat 21 April (WRB).

SWP 1 Ben Venue 25 March (J Broad).

\*RING OUSEL *Turdus torquatus* (b)

C 1 Harviestoun Glen 6 May (S&AN). The species seems to be getting very scarce, all records would be welcome (Ed).

BLACKBIRD *Turdus merula* (B, W)

C In flock with Fieldfares and Redwings Cambus 14 November (BRT). 3 Males taking *Stranvesia* berries Bridge of Allan 9 January.

S 2 singing Airthrey at dusk on 27 January (CJH).

FIELDFARE *Turdus pilaris* (W)

C 1 fed on grapes & apples in Menstrie garden 8-11 February (BRT).

S 200 Gargunock 6 January, 160 Cocksburn Res 1 February, 170 Arnprior 3 March, 30 Plean CP on 17th & 200 L. Coulter on 24th (MVB CJH DT). 400 Kippen 27 October (DT), 350 -> W Airthrey 5

November (MVB S&AN).

SWP 100 Blairdrummond 20 January (DT), last 2 Sheriffmuir 4 May (MVB).

SONG THRUSH *Turdus philomelos* (B,W)

S 15 (flock) with first Redwings Airthrey 3 October (MVB), 5 in garden Causewayhead on 20th (JLB). Yellow-billed bird Beech wood House 11 January (WRB).

REDWING *Turdus iliacus* (W)

C At Menstrie 7 fed on apples 8 January & 10 fed on Holly berries on 12th. 180 Tullibody 8 December (BRT).

S 50 Darn Walk 1 February. 100 in hollies Bridge of Allan & parties feeding in leaf litter under trees on 9 February; 80 ditto Abbey Craig on 10th (CJH). 50 Plean CP 17 March (DT). 1 Airthrey 3 October, 10 on 7th; 5 Bridge of Allan on 7th & 25 on 9th, 50 Kippen on 27th. 140 — SW Airthrey 11 October & 50 -> W on 5 November (MVB CJH S&AN DT).

MISTLE THRUSH *Turdus viscivorus* (B,W)

S 3 At Mine Wood (CJH). 36 -> E Airthrey 21 August (WRB). 20 Bridge of Allan 9 October & 25 Airthrey on 4th (DMB CJH). SWP 3 AoT Doon Hill-Fairy Knowe (CJH).

\* GRASSHOPPER WARBLER *Locustella naevia* (B)

F 1 Skinflats 28 April (GO). Singing in scrub Polmont Wood evening of 16 & 25 May (JW).

C Singing Cambus pool 23 May, mid July (WRB MC).

S 2 Bridge of Allan 4 May (JC).

SEDGE WARBLER *Acrocephalus schoenobaenus* (B)

F 1 Kinneil 12 May (DMB). C First Alva pools 31 May, 4 AoT (MC S&AN). 6 AoT Gartmorn (MC). Still singing Cambus Pool 2 August, none on 17th (CJH).

S 1 migrant singing Airthrey 22 May (MVB). SWP Singing L. Watston 26 May (CJH). Pair Ashfiled from 25 May (WRB).

WHITETHROAT *Sylvia communis* (B)

F Pair raised 2-3 young Jupiter WG (WRB).

C First Alva 15 May (DMB). 4 pairs bred Gartmorn (MC). S First Airthrey 24 May (MVB). SWP First Doon Hill 22 May (CJH), Ashfield 27 May (WRB).

GARDEN WARBLER *Sylvia borin* (B)

C First Menstrie 17 May (DMB). Nest with young Menstrie 23-30 June (S&AN). 2 AoT Dollar Glen, 1 Gartmorn, 3 Brothie Burn (MC).

S First Airthrey 29 May (S&AN), 1 feeding on overripe Gean cherries 26 August (DMB).

SWP 1 Ashfield 17 May, 2 AoT Doune Ponds (WRB). 1 AoT Fairy Knowe, first 19 May. Singing L. Watston 25 May (CJH).

BLACKCAP *Sylvia atricapilla* (B,w)

F Female feeding juvenile Polmont 23 June (JW).

C Singing Menstrie 1 June (S&AN). Pairs at Harviestoun (4), Brothie

Burn (3), Alva WP (2), Dollar Glen (MC).

S 1 Bridge of Allan 25 April (KG). 5 singing Hermitage Wood 25 May.

2 AoT Mine Wood (CJH).

Winter: Male Bridge of Allan 27 January (DMB), female feeding on

apples Bridge of Allan 26 November (JC).

WOOD WARBLER *Phylloscopus sibilatrix* (B)

C First Dollar 31 May, 2 fledglings being fed Gloom Hill 29 June (S&AN). 6 AoT Dollar Glen & 2 Woodhill (MC).

S 2 Mine Wood 18 May (WRB), 1 AoT (CJH).

SWP 2 Doune 13 May (DMB). 6 AoT Doon Hill-Fairy Knowe, first 9 May, widespread by 22nd (CJH).

CHIFFCHAFF *Phylloscopus collybita* (B)

F 2 (1 trapped & ringed) Kinneil 12 January (CMcG).

S Singing Bridge of Allan 5 April (PWS), 2 at Mine Wood (CJH). 3 at Airthrey (CJH S&AN).

SWP First: 1 Doune 25 March (WRB).

WILLOW WARBLER *Phylloscopus trochilus* (B)

F First: 1 Skinflats 14 April (GO).

C migrants at Cambus Pool 17 August (CJH).

S 1 Airthrey 17 April (KG) & 1 Stirling on 25th (RJ). Migrants in garden at Causewayhead 28 July -1 September (JLB).

SWP 2 Lake of Menteith 22 April (DT), 1 Glendevon on 26th (DMB). At DoonHill-Fairy Knowe frequent AoT in young plantation and deciduous scrub (widespread by 28 April) but absent from close canopy oak woodland. In Loch Ard Forest 12 with tits on 7 August and singing on 16th (CJH).

GOLDCREST *Regulus regulus* (B. W)

S 1 AoT Mine Wood (CJH).

SPOTTED FLYCATCHER *Musticapa striata* (B)

F Pair feeding juvenile Falkirk 1 August (WRB).

C Not seen Dollar till 15 June (S&AN).

S 2 Bridge of Allan 1 June (DMB).

SWP 1 Dunblane 28th May (PWS)

PIED FLYCATCHER *Ficedula hypoleuca* (b)

Male singing Airthrey 25 May, did not stay (CJH).

- SWP At Trossachs colony 58 nest attempts fledged 317 young (HR).  
Male singing at nestbox Loch Ard Forest from 8 May, pair on 29  
June with male chasing a juvenile Treecreeper on trunk (CJH).  
Male singing Aberfoyle (Dounan centre) 23 May. Singing Glen  
Lochay 30 June (WRB).

LONG-TAILED TIT *Aegithalos caudatus* (B,W)

- C 12 Tillicoultry 11 February (S&AN).  
S 12 Airthrey 17 & 19 January & 16 on 21st, 14 on 29 December; 13  
Bridge of Allan 1 February & 15 on 17 July. 10 Pendreich 15  
November & 11 Kippenrait Glen on 28th (CJH). In garden  
Causewayhead (max 6) late September to late October (JLB). At least  
7 pairs Plean CP 17 March (DT). 2 pairs Mine Wood (CJH).  
SWP 15 Doune Ponds 27 January (WRB). 22 Dunblane 18 August (MVB).  
13 Pass of Leny 16 November (CJH).

COAL TIT *Parus ater* (B, W)

- S 45 Carron Valley Forest 27 November (CJH).

BLUE TIT *Parus caeruleus* (B,W)

- SWP Breeding numbers very greatly up in Trossachs (HR).

GREAT TIT *Parus major* (B, W)

- SWP Breeding numbers greatly up in Trossachs (HR).

TRECREEPER *Certhia familiaris* (B, W)

- S 3 at Mine Wood, 1 caught by cat at Bridge of Allan (CJH).  
SWP 6 At Doon Hill - Fairy Knowe (CJH).

JAY *Garrulus glandarius* (B, W)

- C Pairs on Black Devon at Forestmill and Birkhill (MC). 1 on Devon at  
Vicars Bridge 26 April (DMB). 2 pairs Dollar, juvenile seen July,  
up to 3 bird seen August and January - February. 2 Tillicoultry  
10 October  
S 1 at Mine Wood (CJH), 1 at bird table nearby on 24 June and 2 on  
14 July (PWS). Recorded in November at Pendreich, Kippenrait  
Glen; Airthrey in December (CJH). 2 Abbey Craig 6 November  
(S&AN).  
SWP 2 AoT Doon Hill-Fairy Knowe (CJH). Recorded in November at  
Doune Ponds, Pass of Leny, Loch Ard Forest (CJH).

MAGPIE *Pica pica* (B,W)

- S 9 Menstrie 2 March (BRT), 14 Gogar 25 March. 2 AoT Mine Wood  
(CJH). SWP 1 in Newton estate Dunblane on 13 November was first  
seen there (MVB).

JACKDAW *Corvus monedula* (B, W)

- C 50 on Ben Cleuch summit 30 May (S&AN).
- S 410 roost flight Airthrey 1 November (DMB).

ROOK *Corvus frugilegus* (B, W)

- C&S rookeries, nest counts: Bridge of Allan N 105, Bridge of Allan S 171;
- Witches Craig 33, Menstrie (Myretoun) 72 (CJH); 117 Gartmorn (MC). 400 Menstrie 1 December (BRT).
- S 1600 (with Jackdaws) to dusk roost Airthrey 31 December (CJH).

CARRION CROW *Corvus corone* (B, W)

- F 70 Kinneil 22 August (CJH).
- S 32 on roof in Stirling 27 January, some bowing display (RJ).

RAVEN *Corvus corax* (B, W)

- C 5 Blairdenon 29 May, 1 above Dollar 1 November (S&AN).
- S Pair frequented Dumyat (MC). 1 Airthrey 8 April & 1 Bridge of Allan 30 November (DMB). SWP 17 sites checked, 13 with pairs and 1 with a single. 11 pairs known to be successful, 5 of these pairs reared 14 young (PSA). 1 over low ground in Loch Ard Forest 28 April & 2 on 31 July (CJH). 2 Aberfoyle 10 October (PWS). 1 Ben Lomond 27 September (**KEY**).

STARLING *Sturnus vulgaris* (B,W)

- C 1750 Upper Glendevon 6 July (S&AN) - another example of post breeding movement to hills (Ed).

HOUSE SPARROW *Passer domesticus* (B,W)

- F 50 Dunmore 25 September (PWS).
- C max in garden at Menstrie 28 (BRT).

TREE SPARROW *Passer montanus* (B, W)

- F 5 Dunmore 25 September (PWS). 30 Falkirk early January (JW).
- S In garden at Causewayhead late February to mid-May & through December (JLB).

SWP 20 Lecropt in January, 40 on 3 February, 27 on 24 March, 10 on 20 November. 10 Thornhill 10 March (DMB MVB WRB DT).

CHAFFINCH *Fringilla coelebs* (B,W)

- S 300 Arnprior 1 December (DT).
- SWP 300 Thornhill 3 March (MVB). Max winter flocks (Ed).

BRAMBLING *Fringilla montifringilla* (w)

- C 1 Tillicoultry 10 February (S&AN).
- S 8 Arnprior 1 December (DT).
- SWP 1 Dunblane 9 February (MVB). distinctly scarce in both winters (Ed).



GREENFINCH *Carduelis chloris* (B, W)

- F 30 Falkirk early January (JW).  
 C Bred Menstrie (BRT), Fledglings seen Dollar 12 June, Airthrey on 13th (S&AN).  
 SWP 25 Gargunnock 15 August S&AN).

GOLDFINCH *Carduelis carduelis* (B,W)

- F 20 Bo'ness 22 August (PWS).  
 C 5 Alva 20 January (BRT). 10 on thistles Dollar 12 October, 35 Cambus on 27th; 9 Upper Glendevon Res 5 November (CJH S&AN).  
 S 25 Airthrey 19 January & 15 on 25th, singing there on 25 May. 25 on burdock Bridge of Allan 7 December (CJH).

SISKIN *Carduelis spinus* (B, W)

- 1 17 Jupiter WG 17 November (WRB).  
 C 10 Tillicoultry 1 February, Dollar: 15 (1 ringed) on 26 January, 25 on 9 February, 9 on 29 July, 25 on 14 September, 15 on 23 November; 17 Cambus 30 November. Feeding on nut bags Menstrie & Dollar (S&AN BRT). In past years has been very scarce as a breeding species in Devon Valley, the July records suggest an increase (Ed).  
 S 11 Bridge of Allan 19 January, 20 on 9 February & 18 on 23 October. 30 Airthrey 21 January (CJH). Max 5 in garden Stirling early January to mid-March (RJ). Displaying males numerous Carron Valley Forest (Cairnoch) 24 March (DT). 20 Airthrey 29 December (CJH).  
 SWP 200 Torrie Forest 13 April (DT). 35 Dunblane 29 September (MVB). Displaying males frequent in Doon Hill - Fairy Knowe in May (CJH).

LINNET *Carduelis cannabina* (B, W)

- F 180 Kinneil 27 January (MVB).  
 C 35 Alva 9 January, 16 on set-aside Dollar 28 June (S&AN). SWP 200 Ashfield 27 January, 160 Kinbuck 6 October (MVB).

TWITE *Carduelis ilaviostris* (B, W)

- F Kinneil: 70 on 12 January & 75 on 13th, 40 on 9 February, 90 on 10th & 30 on 13th; 3 on 19 October (CMcG RS DT). Skinflats: 21 on 16 January, 40 on 14 February, 25 on 10 November, 60 on 5 December (DMB MVB). 50 Kincardine Bridge 12 & 13 November (SS).  
 C Nest with c/6 found on Ben Ever by DB on 29 July, in a cranny of a rocky outcrop at 540m; young well grown on 18 August, 5 fledged on 22nd (DB MC). First confirmed breeding within Clackmannan District (Ed).  
 SWP 45 Ashfield 4 March (WRB). 30 Kinbuck 6 April (MVB). Pair Upper Glendevon 24 May, 15 on 5 November; 3 S Queich 20 July (CJH S&AN). 3 Balquhiddier (Edinchip) 21 May & 17 June (PWS).

REDPOLL *Carduelis flammea* (B, W)

Breeding distribution spotty and poorly documented (Ed).

C Dollar: February-April max 5 on 28th, 1 on 30 June & 6 on 13 July; on 22 September; 45 Gloom Hill 12 May (S&AN).

S 30 Plean CP 17 March (DT).

SWP 3 Gartloaning (Gartmore) 27 May (CJH). 30 Dunblane 24 July (MVB).

COMMON CROSSBILL *Loxia curvirostra* (b, W)

More records than usual, presumably the after effect of the large influx of 1990.

C At Dollar max of 25 on 26 January, 34 on 2 February, a few through spring to 24 on 12 May, seen till 17 August with juveniles on 7 June & 7 July - probably bred (S&AN). S 12 Carron Valley Forest on 6 January & 50 on 27th (one party feeding on beech mast), 13 on 24 March (DT). 2 singing Mine Wood 21 January, 10 Bridge of Allan on 19th & 9 on 24th (CJH). 10 -> SE Airthrey 27 May, 1 on 27 September (DMB).

SWP 15 L.Lubnaig 3 February, 1 Lake of Menteith 2 February (RAB). 8 Menteith Hills 10 March & 2 on 26 April; 20 Torrie Forest 13 April (DT). 2 singing L.Ruskie 23 March; 8 Doune 21 April & 16 on 15 May (DMB WRB), 4 Dunblane 28 June (MVB). 17 Fairy Knowe 28 April, 11 on 19 May & 5 on 27th (CJH).

\*HAWFINCH *Coccothraustes coccothraustes* (b?,w)

SWP 4 over Doune 3 February, 1 Moray Park 13 January (WRB).

\*SNOW BUNTING *Plectrophenax nivalis* (W)

F 1 Kinneil 13 January (DT). Does anyone look on the hills these days (Ed) ?

\*YELLOWHAMMER *Emberiza citrinella* (B,W)

F 60 Falkirk in early January (JW).

C 16 Dollar 27 January - 9 February (S&AN). 16 Menstrie 7 December (BRT).

S 25 Gogar 25 March (CJH). In garden at Causewayhead early January to mid April & late October to end December (JLB).

REED BUNTING *Emberiza schoeniclus* (B, W)

F Kinneil: 30 on 13 January, 100 on 10 February (DT); 4 pairs bred (RS). Pair Jupiter WG, possibly bred (WRB).

C 6 Menstrie 7 December, pair Cambus Pool on 8th (BRT).

S 22 Bannockburn 1 February (CJH). SWP 15 Lecropt 23 December (MVB). Singing L.Watson 26 May (CJH).

\*CORN BUNTING *Miliaria calandria* (b,w)

F 1 Airth/Skinflats 26 July (CJH), 3 on 23rd (WRB).

The following species have occurred in the area but no special comment can be made from the records submitted:

PTARMIGAN *Lagopus mutus* (b,w), WREN *Troglodytes troglodytes* (B,W), HEDGESPARROW *Prunella modularis* (B,W), BULLFINCH *Pyrrhula pyrrhula* (B,W).

Some additional records for 1989 and 1990 have been received since the the 1990 Report was compiled, the following list quotes only those that alter (i r significantly add to the picture given by previously published material:

RED-THROATED DIVER *Gavia stellata* (b,w)

1989: 2 Carron Valley Res 12 October (DLC).

HKAN GOOSE *Anser fabalis* (W)

1989: 60 Carron Valley Res 28 September to 1 October, 52 on 5 October and 86 on 14th October (CJB RGC JGS).

COMMON SCOTER *Melanitta nigra*

S 1989: Female Carron Valley Res 29 July (JND ADW).

KINGED PLOVER *Charadrius hiaticula* (b,W)

S 1989: 50 Carron Valley Res 29 July (GJB) - a very large flock inland (Ed).

ICELAND GULL *Larus glavcoides*

SWP 1990: 1 Kinbuck 28 February (PWS).

CROSSBILL *Loxia curvirostra* (b,W)

S 1989: 160 Carron Valley Forest 19 January, few late in year but 4 singing on 29 December & 5 seen on 31st (JM GJB MEO).

These records from: P W Sandeman and, per I P Gibson, C J Baister, G J Brock, R G Caldow, D L Clugston, J N Darroch, R C McAlpine, J Mitchell, M E Osier, J G Simpson, A D Wood.

**Note:** paper of interest in recent *Journal of the Perthshire Society of Natural Science* XVI, 1991. 14-29. The status of autumn passage and winter wader populations on the Inner Tay Estuary, 1971-1989, by Sylvia Laing and N.W. Taylor.

## ENVIRONMENT NOTES

### **The Operation Brightwater Survey of Lochs and Ponds in Central Region**

Lochs and ponds in Central Region are an important feature of the landscape. These waters have been the focus of a research project based at Stirling University, investigating their wildlife conservation value. This forms part of a larger Scottish campaign called Operation Brightwater, organised by the Scottish Conservation Projects' Trust, which aims to raise public awareness about the importance of aquatic environments as habitats for wildlife.

The photograph on the back cover of this volume 15 is of one of the smaller waters - an old mill lade near Fintry.

An Information Pack on Project Brightwater is available from Scottish Conservation Projects, Balallan House, 24 Allan Park, Stirling, FK8 2QG. Tel.

(0786) 79697.

**After Rio** is the lead paper in the latest issue No. 8 of the CWS bulletin *Co-operators for the Environment* (CFE) by its editor, Roy Martin.

**Key Environmental Issues** is a series of expert commentaries backed by British Gas. The 14 pamphlets to date include (3) Global Climate and (4) The World Environment.

### **Policies for Environmental Education and Training 1992 and Beyond, a**

Conference Report, editor Adam Cade, September 1991, 90pp, a co-production by English, Welsh and Scottish Countryside/Conservancy bodies and Department of Environment. Over 20 contributions on (1) Achievements, needs and opportunities, (2) Policies in practice, (3) Requiring policies in national and European contexts.

**New Horizons 1991 BP** Health, Safety and Environmental Policy 78 pp.

**TROPICAL WATER FERN *Azolla filiculoides* LAMARCK  
ON AIRTHREY LOCH, STIRLING UNIVERSITY**

Olivia Lassiere  
University of Stirling

This free-floating water fern, has this August formed a 2ha floating mass at the eastern end of Airthrey Loch on the University Campus (Figure 1). This is apparently the first record for this VC 86 area. Previous records in Scotland are on small ponds (a) in 1984 by T. Gray (1985) in Leslie, Fife (b) in 1981 in Edinburgh by J. Muscott (1983), and (c) this year at Kinneil also by Jackie Muscott (1992 pers. comm.).

This small plant, 10-100mm in diameter, is bluish-green in colour and has unicellular hairs covering the upper surface of the fronds which make the surface non-wettable (Clapham ... 1989, and Figure 2). This introduced species originates from tropical America and is unusual in that it supports populations of nitrogen fixing cyanobacteria. Field experiments in China have used it as a type of biofertilizer in conjunction with spring rice crops (Lumpkin 1983). A related species *Azolla pinnata* has been grown for centuries in northern Vietnam and south eastern China as a nitrogen fixing green manure for rice (ibid).

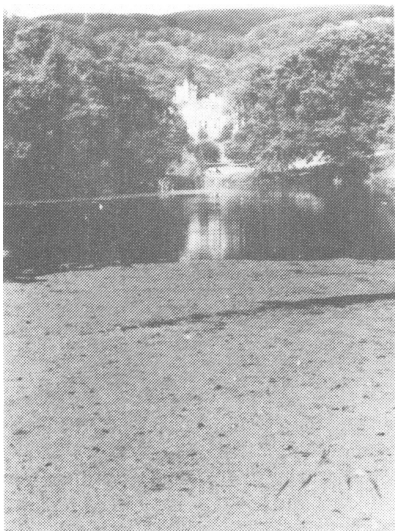


Figure 2: A droplet of water trapped on the non-wettable hairs on the upper surface of *Azolla filiculoides* fronds. (Magnification x2).

Figure 1. *Azolla filiculoides* on Airthrey Loch, August 1992—looking towards Airthrey Castle.

The distribution in Britain has been described as local, in the south of England (Haslam .... 1975) and the Atlas of the British Flora has no records of this species in Scotland (Perring 1976). However, it has recently extended its range to the Isle of Man and S E Yorkshire (Clapham .... 1989). Clearly the plant is able to survive and grow in the Scottish summer temperatures.

The origin of the population in Airthrey Loch is unknown. *Azolla filiculoides* is stocked by at least one garden centre in the vicinity and this may be the source. The main natural method of dispersal is via water, although animals have also been implicated (Cook 1990). Observations at Airthrey Loch have shown that the waterfowl could be potential dispersal agents (Figure 3).

The author would be glad to hear about any other sitings in Scotland.

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Figure 3: A female tufted duck amongst the water ferns in Airthrey Loch

## **PREHISTORIC ROCK ART - AN INTRODUCTION** **a preface to Van Hoek's Menteith survey**

Lorna Main

Prehistoric rock carvings occur widely in continental Europe and Britain. Similar patterns appear in areas as widely apart as Spain and Orkney. In Britain they are found north of a line from Anglesey to the Wash with particular concentrations in Yorkshire, Northumberland, Dumfries and Galloway, Argyll, Central Scotland, south-west Ireland and Donegal.

These carvings include a wide range of symbols, including - cups only, cup-and-rings, spirals, zig-zags, arcs . . . . The Menteith area includes examples of the first two types with some elaboration. Cup-and-ring marks commonly appear as a depression, each one surrounded by one or more concentric rings, often with a line or 'tail' penetrating the rings. Some seem to be enlargements of natural depressions while others are completely artificial. Although known I mm standing stones and stone circles, with the exception of some from Irish passage graves, the more complex carvings usually appear on natural boulders or outcrops of rock mainly in Highland areas. From their association with chambered tombs, standing stones and short cists, such carvings are known to date to the late Neolithic Age (around 3000 BC).

Cup-and-ring markings are numerous, widespread, and standardised, so they cannot be dismissed as random or meaningless. Many attempts have been made to de-code their symbolism but no single explanation has obtained a consensus among researchers. Possible explanations are as numerous as the carvings themselves. They include marks made by early copper and gold prospectors and pilgramagers, fertility symbols, cups for blood sacrifice, early clocks, memorials to the dead, maps of the countryside or stars, boundary marks or written messages. Strongly favoured is an astronomical function associated with the observation and recording of celestial movements.

Today the more familiar forms of expression are the written and spoken word. Music and art are more subtle but still vital to our wellbeing. In prehistoric times, there was, as far as we know, no written word and the spoken word may have been limited to person-to-person communication. Music there probably was and art there certainly was. The prehistoric rock carvings which have survived in some of the Irish passage graves and on our Scottish hillsides are richly beautiful, skilfully executed and highly evocative - they are indeed 'art.'. Whether the great variety of designs were chosen more for their aesthetic qualities or their religious and spiritual symbolism is impossible to prove but their recording is an important step in their greater understanding and the paper which follows represents an important contribution to this work.



Figure 2. Menteith area, No 12 in Foreground... Van Hoek



Figure 1. Mentieth 1 — Peace Stone....K. Mackay



## **A SURVEY OF THE PREHISTORIC ROCK ART OF THE PORT OF MENTEITH PARISH, CENTRAL SCOTLAND**

By Maarten A. M. van Hoek

### **INTRODUCTION**

A three-day survey in October 1989 by the author and his wife revealed new prehistoric rock art sites in this area northwest of Lake of Menteith some 5km east of Aberfoyle.

Rock art was known in the parish before. In 1899 A. F. Hutchinson reported the well known Peace Stone No 1 (Figure 1), near Mailing (Morris 1981 60-1), and for a long time the only known site. In 1984 however Newall and Morris (1984) reported three cupped stones (No's 4, 13 and 26) in the hills north of the lake. Then Mrs Main (1985) reported site No. 34 at Nether Glenly and a further general archaeological survey by her and members of the Stirling Field and Archaeological Society yielded four more sites (No's 14, 17, 35 and 36) - recorded, though wrongly credited, in Bailey (1987). Preparing a visit to the area, the author (1989) was much helped by Mrs Main, Archaeology Officer of the Central Regional Council, and informed of the existence of further sites: (Nos 2, 4, 5, 13, 22, 26 and 32). Altogether 13 sites were known at that moment. However, in October 1989 the author and his wife located 23 new sites (No's 3, 6, 7, 8, 9, 10, 11, 12, 15, 16, 18, 19, 20, 21, 23, 24, 25, 27, 28, 29, 30, 31 and 33) and at No's 17, 36 and 26 added some extra carvings. Half the number of rocks bear cups-only. The large number of new sites and the confusing existing names (without any numbering) made it necessary to re-name all sites MENTEITH and assign individual numbers. Therefore the Peace Stone, also known as Mailing, is now named Menteith 1, being the first stone to be discovered in the area.

Note: except for figures 5 and 14, the sketch plans of the engravings are about one sixteenth actual size - scale 31 mm = 50 cm.

### **SITUATION**

The group of rock art sites at Menteith is situated on the southern slopes of the Menteith Hills (Figure 2). To the south the area commands wide views of Flanders Moss and other areas with rock art notably Mailing (some 2km to the south), Blarnaboard and Corrie (about 8km to the southwest), and even Leckie and Stirling (King's Park) to the southeast.

Possibly the Menteith group forms part of a band of rock art sites indicating a prehistoric route from the Clyde estuary (where the Greenland and Whitehills sites form a marked concentration) up to Loch Tay. Minor intermediate sites, such as Craigmaddie Moor, Corrie, Balquhiddy and Mid Lix seem to confirm this idea. Recent discoveries at

Blarnaboard, south of Aberfoyle, also fit in this possible prehistoric route, which avoided the then dense oakwoods of the Forth Valley. The Menteith group is distinctly linearly developed, and possibly indicates the route-way itself. This area has everything for a perfect siting concerning rock art.

The maps of Figures 3, 4, 5 and 6 indicate the position of each individual engraved rock although all distances and locations are approximated. Solid dots represent cups-only rocks; open circles show cup-and-ring stones and a dot in a circle indicates cup-and-ring rocks with special motifs.

The sites more or less form an arc from southwest to northeast and are roughly situated between the 20m and 200m contours. The major groups however are found between the 150m and 180m contours and thus do not occupy the highest positions available. There is no distribution pattern concerning simple and complex engravings and no preference for a specific slope direction or a specific slope value, although many surfaces are roughly horizontal. Most of the carvings are on outcrops of sandstone. Some of the cups-only boulders however are of rough conglomerate and therefore it is hard to establish whether depressions are artificial cups or worn natural holes.

DESCRIPTION OF THE ROCK ART SITES THE CUP-ONLY STONES

There are 18 cup-only stones and probably more will show up in future surveys. Details of the locations and altitudes given here are also in *Discovery and Excavation in Scotland* (Van Hoek 1989). None of these show any attempt at arranging cupmarks in geometrical patterns, i.e. positioning is random. There is also no preference for a specific size for cupmarks, although the loose conglomerate boulders have somewhat larger cups, possibly inspired by natural depressions on such stones. Cupmarks on outcrops are mostly smaller and shallow. Table I gives details on number of cups and type of stone of each cup-only site.

TABLE I. The cup-only rocks in the Port of Menteith Parish; 1989

Menteith No.	2	3	4	5	6	8	11	13	14	15	18	20	21	22	27	29	30	31
No. of cups.	11	3	3	14	2	1	1	11	1	1	13	10	?	4	3	2	1	
Outcrop+?-	-	-	-	-	+	+	+	-	?	+	+	-	+	-	+	+	+	+

+ means confirmed natural/living rock;  
 ? unconfirmed;  
 - not a natural outcrop - a 'loose' rock/boulder

THE CUP-AND-RING STONES

Sites with more complex rock art designs than simple cups will be described in more detail. A sketch of each site gives an impression of the distribution of the glyphs (grooves/incisions) on the stones, with the emphasis on the bolder engravings; faint, worn or delicately pocked

glyphs are stippled or thinly drawn. All rock-drawings (except Figure 5 and 14) show a .31mm = 50cm scale. The larger arrow indicates the magnetic north (1989) and the smaller arrows indicate the slope of the carved surface of which values are mentioned in the text. The number near each sketch is the Menteith number, also shown on I hr locations maps (Figures 3, 4, 5 and 6).

The stone at the lowest altitude in the parish is the Peace Stone or Menteith 1 (NS 5641-9954; 20 OD.). It probably forms an intermediate site between the smaller concentration at Blarnaboard and the large group to its north. This stone (Figure 1) is described by Morris (1981) and Main (1985). Possibly more rock art will be discovered on the outcrops south of the road to Aberfoyle.

The approach to the first group is best made via the field northwest of Arntamie farm. A roughly linear group of cupmarked boulders (No's 2, 3, 4 and 5) leads to a group of complex rock art sites. This group (B Figure 5) lies just east of a very large (uncarved) outcrop table on top of an isolated hillock.

The first carved stone here is Menteith 6, an easily recognised dike-shaped outcrop with one certain solo cup. A few metres east is Menteith 7 (NN 5611-0170; 152 OD) a smooth outcrop sheet sloping up to 11° southwest (Figure 5), with one solo cup, two cups with two rings plus a possible third example near the three cups with one ring. There is possibly more under moss and turf or overgrown by bracken. This also goes for Menteith 9 (NN 5613-0172; 155 OD) which is a similar outcrop sheet (Figure 7) with at least five cups with single rings; two cups with two rings; one cup with three rings and three solo cups. Its surface slopes up to 8° southwest.

Very interesting are the designs at Menteith 10 (NN 5615-0176; 157 OD). This is a smooth horizontal outcrop sheet with at least three single cups and one possible one; one heart-shaped groove; one ring-only; a large broadly pocked oval groove enclosing one irregular ring only, one ring with a small dot at its centre and an irregular (gapped ?) ring having a crude tail from near its centre (no cup). This groove however resembles a ploughscratch. Budding from the large oval is an angular cup-and-one-ring.

The best site of this group and possibly of the whole area is Menteith 12 (NN 5618-0175; 156 OD). It bears a rich collection of designs, mostly grouped in rows (Figures 8a and b). There are at least 13 single cups and some natural depressions and pittings. Also seven cups with one ring; nine or ten cups with two rings; one or two cups with three rings and three cups with four rings. Remarkable is a cup with seven mostly unfinished rings, all delicately pocked out. Next to this is a large cup with two gapped rings and a tail similar to the tail on No. 10. On the west-half are two faint rings-only, all possibly gapped.

Across the high stone wall is a low hillock forming the highest point of the next field. On its west slope is the second cluster of sites C (Figure 6).

Near the top of the hillock are two sites (Figure 9) in a roughly circular grassy area amidst the bracken. Menteith 16 (NN 5628-0199; 180 OD) is a small outcrop sloping 7° northeast with one cup with an incomplete ring which continues as a long curved groove. There also are four single cups of normal sizes and a cluster of four midget-cups. Menteith 17 is a large rough outcrop only some 2m north of No. 16, sloping 3° northeast. Only the southwest part of this rock may be exposed; it has 19 single cups, 12 cups with one ring and two cups with two rings. Dominating is a cup with five irregular rings and a tail from the cup to the outer ring, all clearly and delicately pocked.

A small burn northwest of No. 17 has produced a series of outcrops of which one, Menteith 19 (NN 5624-0201; 175 OD) forms a smooth surface sloping 4° west (Figure 10). It bears a long groove that spirals around an imperfect cup-and-two-rings. Because of the much worn nature of the engraving it cannot be established whether this represents a real attempt at carving a spiral. There are also 13 other cups (two not shown here appear on a continuation of the rock about 1m further southwest) and a small oval basin, probably natural.

Further east is an area with rough grass and large patches of bracken where, in two fields, a number of more isolated rock art sites is found. Menteith 23 (NN 5656-0199; 165 OD) is a large smooth earthfast boulder on the edge of the bracken with at least five single cups and one cup with one ring. One of the single cups may possibly have a partial ring. This boulder slopes 14° northwest and west. Out of sight of most other sites is Menteith 24 (NN 5676-0202; 138 OD) which is a smooth outcrop sheet some 12m west of a high stone wall. On its smooth surface, sloping 9° east, is a cup with one rather small ring. Further uphill is Menteith 25 (NN 5660-0210; 160 OD). It is a rough earthfast gritstone boulder, sloping 24° northeast where carved. It has an imperfect cup-and-two-rings and the possible remains of a third and fourth ring.

Menteith 26 (NN 5650-0211; 175 OD) forms the top of a slight knoll. It comprises an irregular outcrop, now largely covered with short grass, which is deeply scarred by long and deep natural waterworn channels (Figures 11 and 12). The exposed parts form two parallel bands of much weathered cups. Some of the cups show traces of one or two rings and also a series of faint curved grooves and two possible gapped rings-only. Covered up and therefore better preserved is a cluster of cups near a cup-and-two-rings and two cups with a single ring and a cup with two rings, partially flaked off. Here again are the very faint traces of a possible (gapped ?) ring-only. This rock has the largest number of cupmarks in the area. More than 100 cups have been counted, including doubtful ones. The rock slopes from horizontal up to 5° northwest and 18° northeast where carved.

Just visible from No. 26 is the very large outcrop of Menteith 28 (NN 5653-0223; 165 OD). Dominating this rock are the several very large and smaller natural basins (some worked on). There also are some 42 faint single cups and one possible cup-and-one-ring. Being covered is a fine group of engravings (Figure 13) at its northwest end, where the rock slopes 14° northwest. Most striking is an inverted U-shaped groove enclosing a finely engraved cup-and-four-rings with a long tail. This set however is still so much weathered that it is rather difficult to make out its exact pattern. Nearby is a pocked ring-only enclosing a shallow bowl-shaped depression with very clear big pockmarks. The only parallel of such a feature is found at High Banks A3, Galloway, which however also features a central cup. A little further is an unfinished rosette: a larger cup with a partial ring of four smaller ones. Another rosette of large crude pockmarks, but this time without central cup, appears on the less steep east slope of the largest basin near the south edge of the rock.

In the next field and just north of a stone wall is Menteith 32 (NN 5673-0246; 160 OD), a very extensive outcrop sheet sloping 2° east. It bears four single cups and some possibles - one cup with a large crudely pocked ring and one horse-shoe oval, more delicately engraved and enclosing a small excentric cup. From this site a track runs north through the bracken and at the west side of this track is Menteith 33 (NN 5674-0263; 172 OD). This smooth outcrop sheet, sloping 11° east, revealed one cup with two lightly pocked rings after cleaning. The inner ring may be gapped.

Across Glenny Burn is the last group of sites. Hard to find in the bracken is Menteith 34 (NN 5687-0275; 169 OD). It is a small outcrop (Figure 14) sloping 4° southwest and 10° west. It bears the weathered remains of one cup with three rings and a much larger fourth ring and two, perhaps four, grooves, one partially encircling the nearby cup with one ring (but see addenda and Figure 14). Even harder to find in the bracken is Menteith 35 (NN 5691-0273; 166 OD) which forms a rough horizontal outcrop with six single cups, placed quite wide apart and two faint cup-and-one rings.

In the field to the south of No. 35 and southeast of a large tree near a wall and just northwest of the track through the bracken are Menteith 36A and B (NN 5704-0228; 146 OD). Rock B is slightly above and to the northeast of A and has one solo cup. Rock A (Figure 13) is a smooth outcrop, sloping 10° southwest, with a rough appearance because of the many cups. There are at least 25 single cups, 13 cups with one ring and one cup-and-two-rings, all rather close together. The engravings are much weathered and therefore more cups may have had rings.

## CONCLUSION

The rock art of the Port of Menteith parish can compete with many other rock art areas in the British and Irish islands, both in number of sites and motifs and in diversity of motifs. As usual there are one or two 'main' sites (No's 12 and 26) and although there are few special designs, the motifs at No's 10 and 28 enhance the character of this rock art group

## ACKNOWLEDGEMENTS

I am most grateful for the help received from Lorna Main, Archaeology Officer of the Central Regional Council. I am also much indebted to my wife Elles who ably assisted me in surveying the sites.

The maps in this paper are based on the 1 : 10.000 Ordnance Survey Map, Sheet NN 50 SE (1978), Crown Copyright Reserved. However, any inaccuracy on these maps and all other illustrations are the responsibility of the author.

## ADDENDA

A check-up of the area by the author on 13 October 1990 yielded three new sites (Nos 30A, 34A and 35A) and additional carvings at No. 34.

No. 30A. (NN 5662-0228; 155 m OD). South of No 30, just north of an area with bracken at the head of a small burn north-west of a rocky miniature gorge lies this large loose conglomerate slab in grass. It has a very rough surface. On it are some 30 cup-shaped depressions, many are natural but at least a dozen are man-made.

No. 34 (Figure 14). Here one extra cup, one ring (8cm diameter) and some 13 faint cups were found exposed being excavated by an unknown researcher. No. 34A (NN 5689-0274: 167 m OD). This smooth outcrop, some distance SE of No. 34 and largely overgrown with bracken, has two certain cups on its exposed SW sloping surface.

No. 35A (NN 5692-0271; 165m OD). Further SSE from No. 35 and hidden in deep bracken is a smooth outcrop with at least 13 certain cups and some nine very faint or doubtful (Figure 14). Two cups show faint traces of possible rings. There is one clearly pocked cup and one ring 8cm diameter). Below this is a fainter horse-shoe (smallest diameter 4.5 cm) with a slight boss in its centre. Nearby is an ovaloid pocked ring (8.5 x 10.5 cm) enclosing a small arc (an unfinished second oval ?). This part of the rock slopes about 12° to the west, whereas the rest slopes 8° south. There are possibly more grooves, almost weathered off, like the chalked groove near the cup-and-one-ring.

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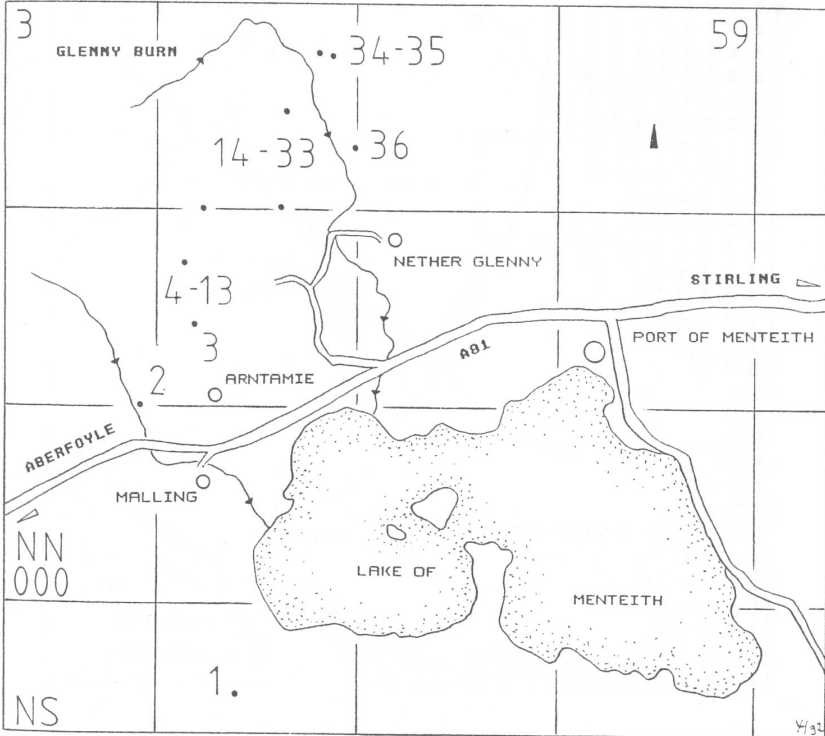
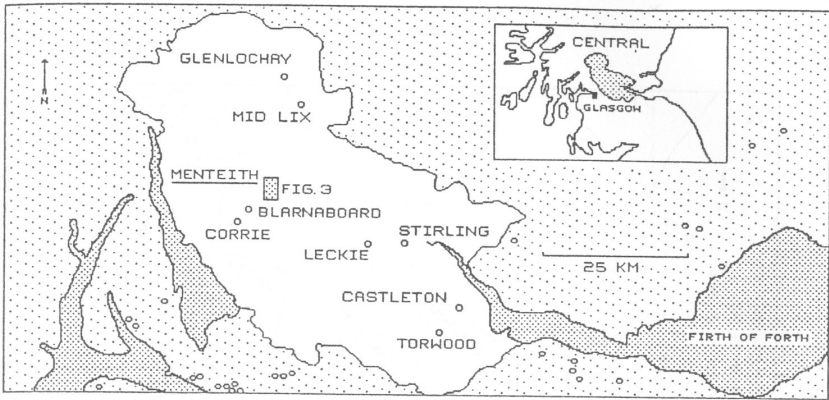


Figure 3 Menteith rock art site and stones locations

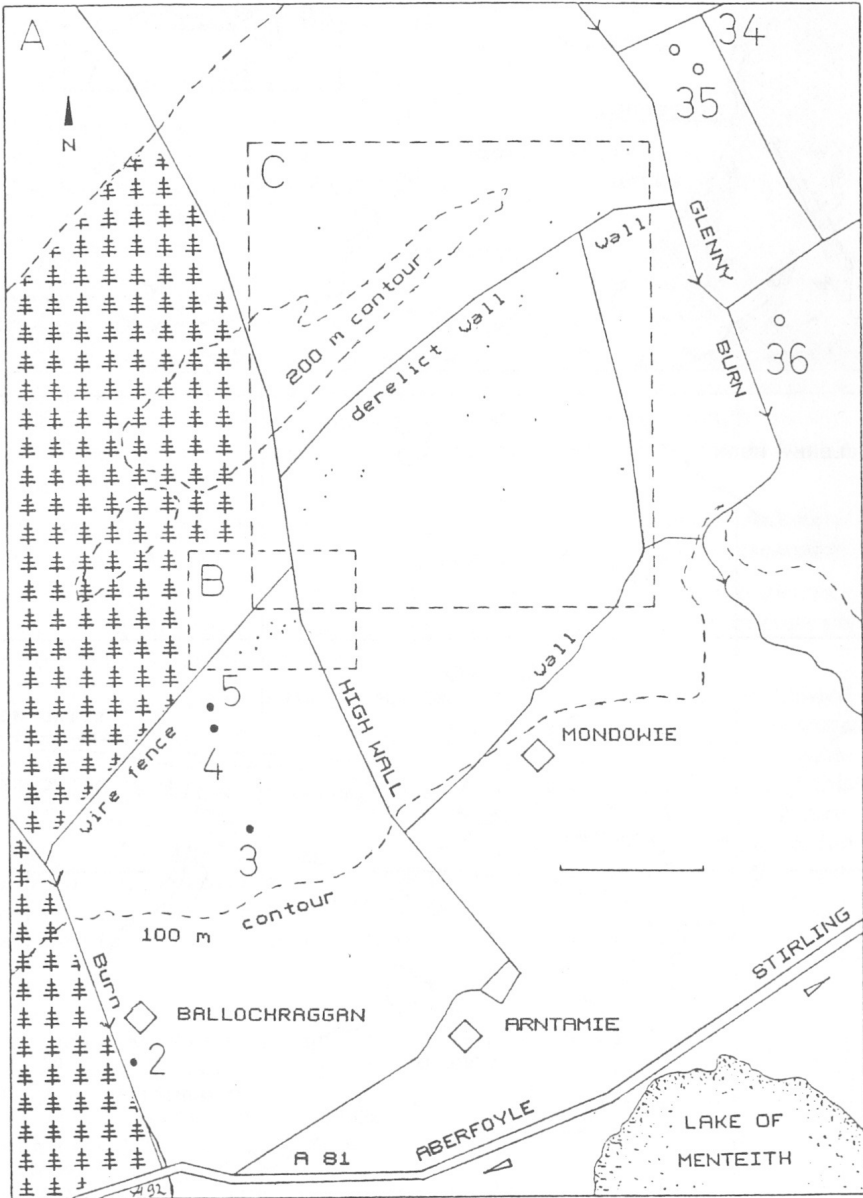


Figure 4. Site plan A – insets B and C



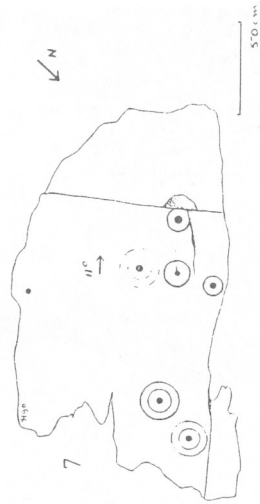
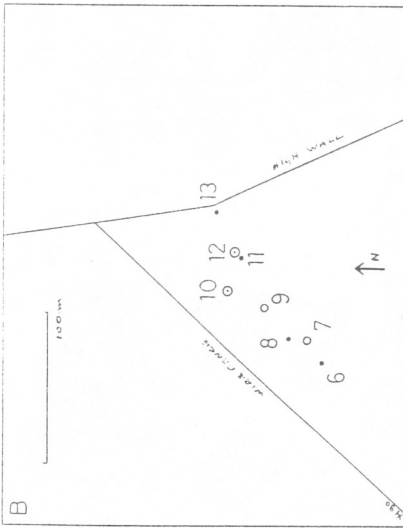


Figure 5 Menteith area B—stones 6 to 13 locations—  
scale 100m  
Plan of stone No. 7—scale 50 cm

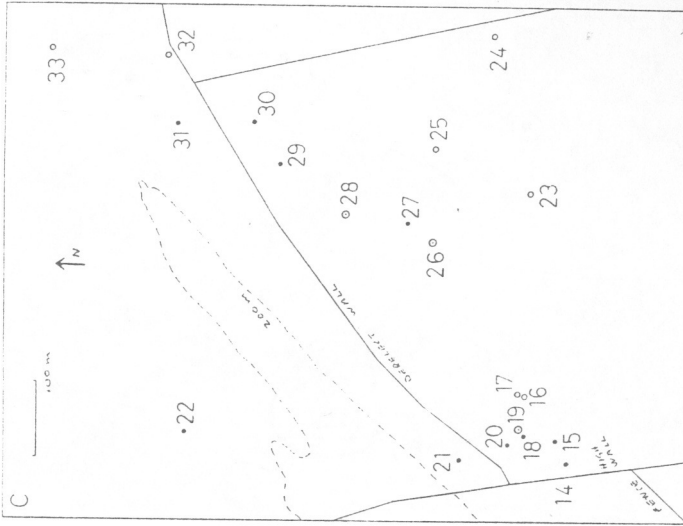


Figure 6 Menteith area C—stones 14 to 33 —  
scale 100m

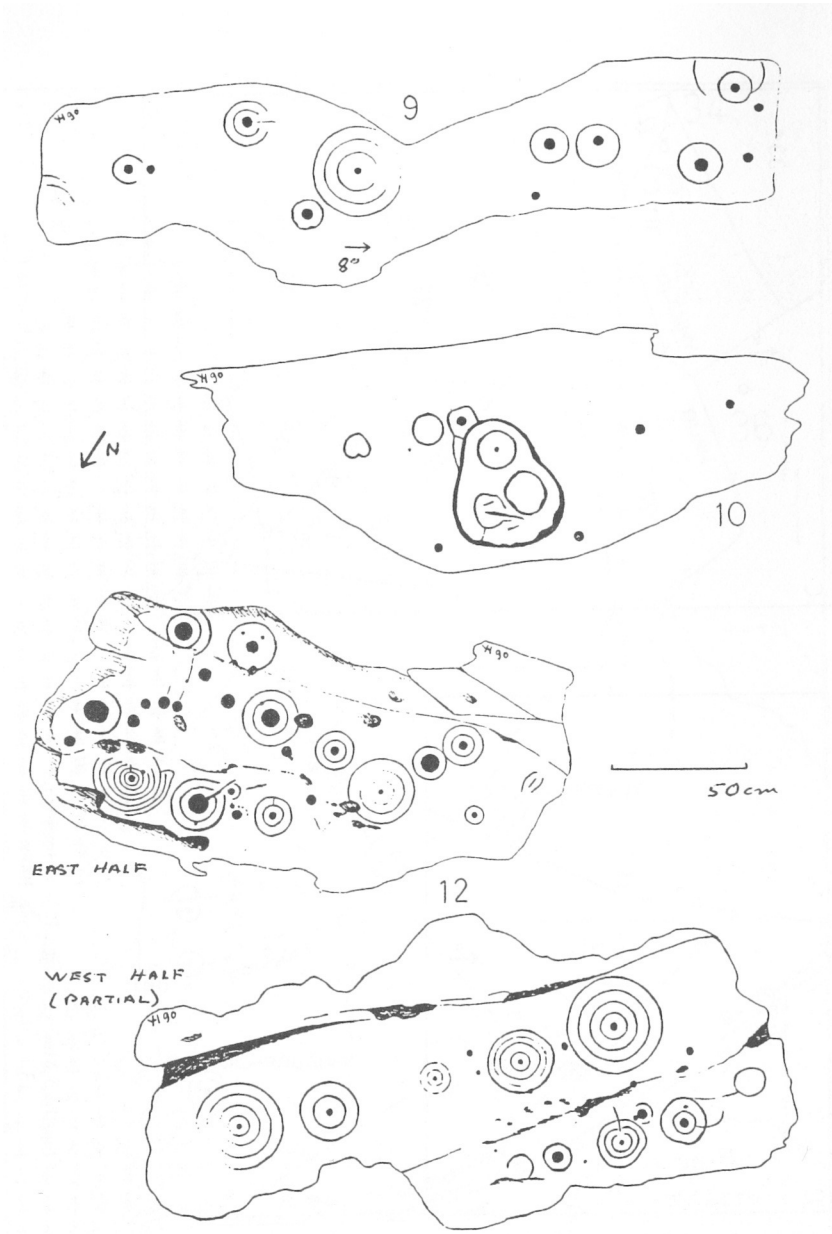
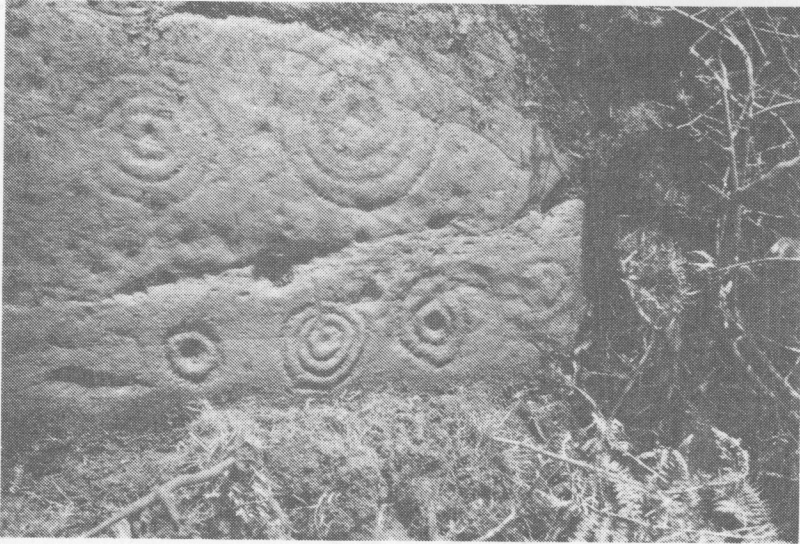


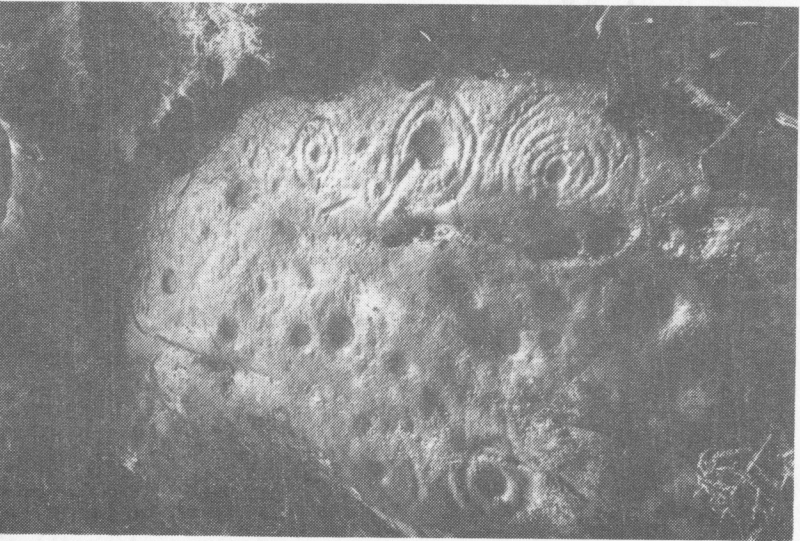
Figure 4 Site plan A—insets B and C



Van Hoek

No 12 West half

Figures 8A and B



No 12—East half

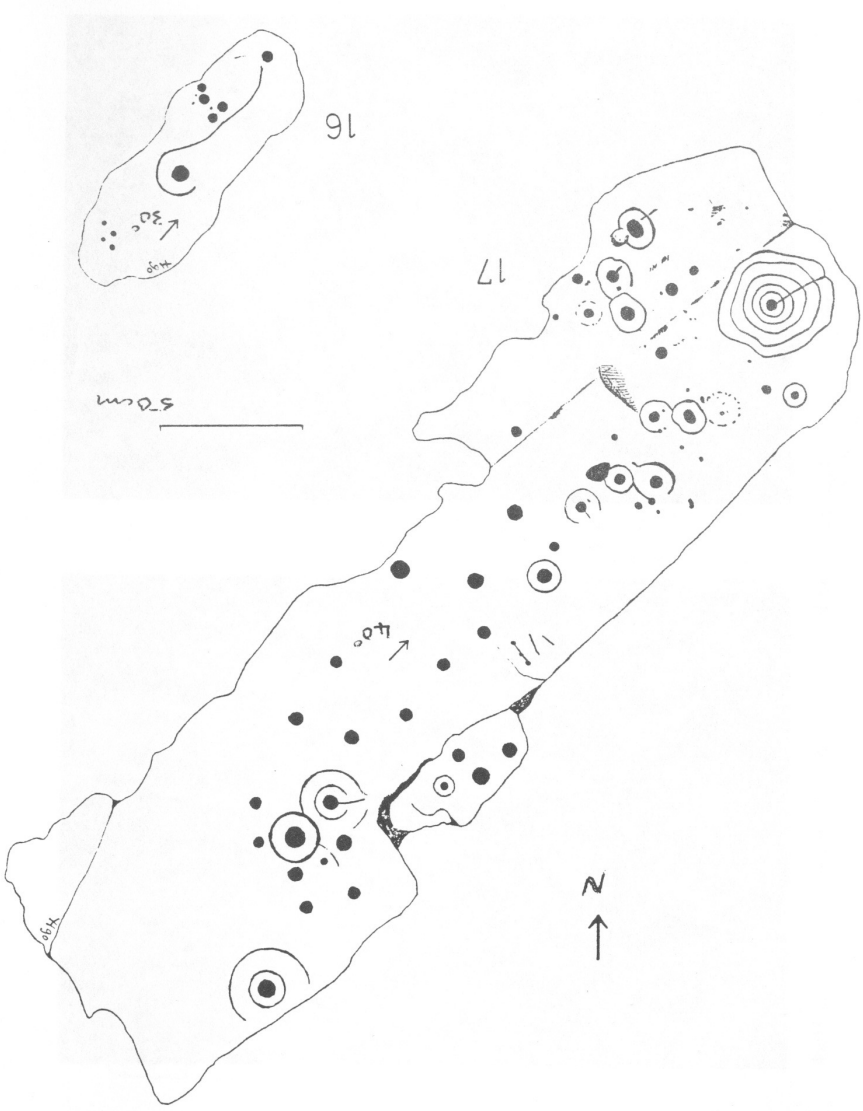
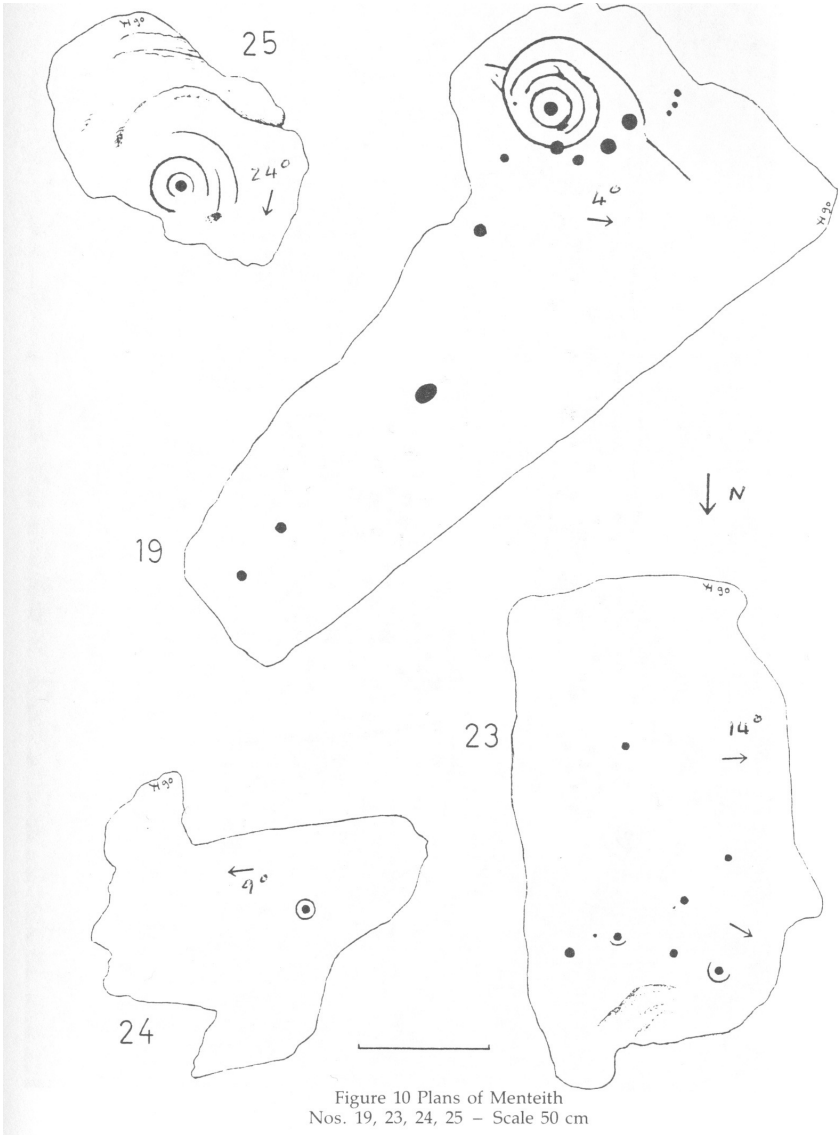


Figure 9. Plans of Menteith Nos. 16 and 17—scale 50cm



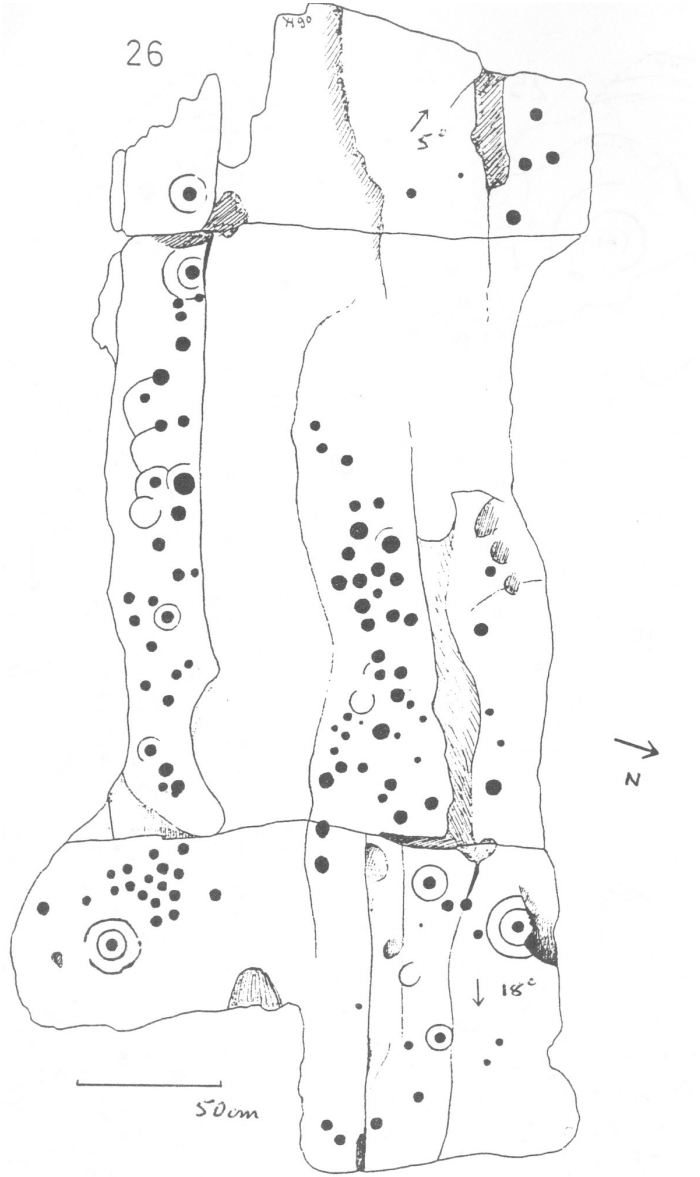


Figure 11. Plan of Menteith No. 26—scale 50 cm

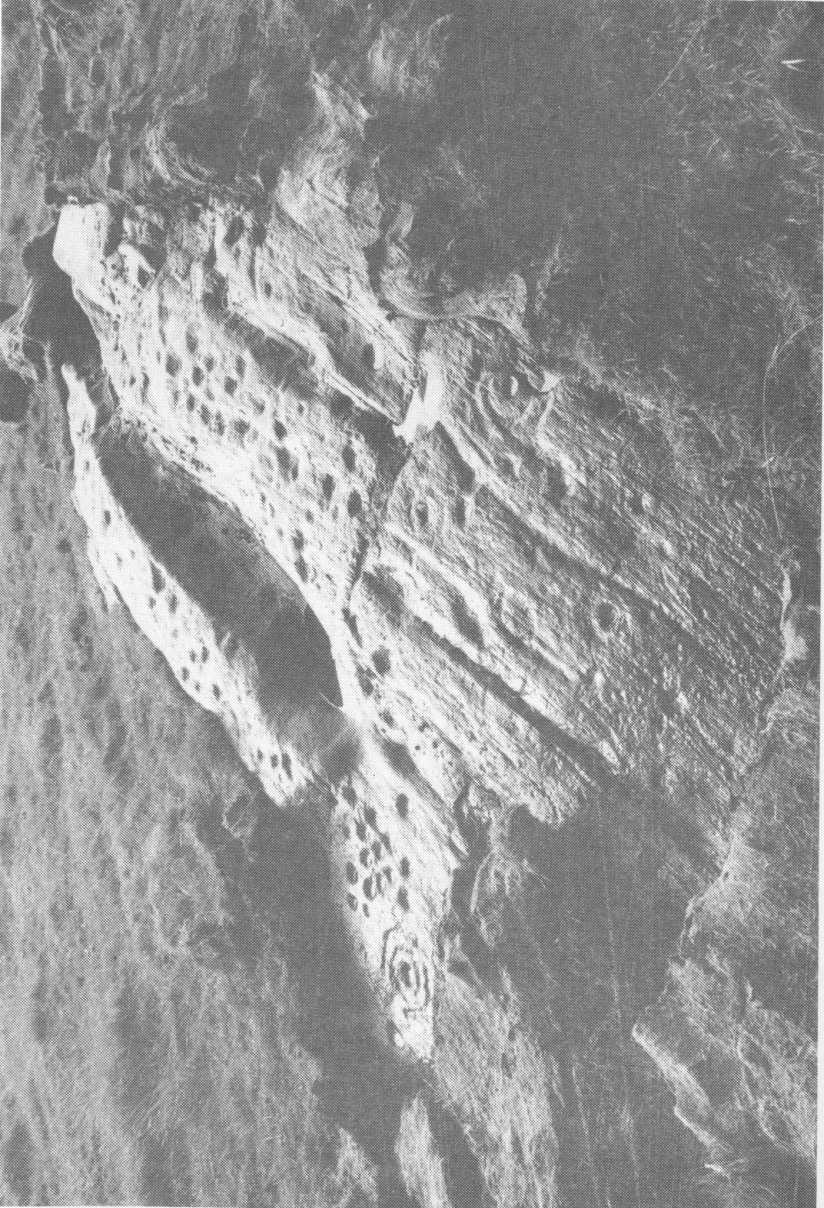


Figure 12. Photo of mentieth No. 26 .... Van Hoek

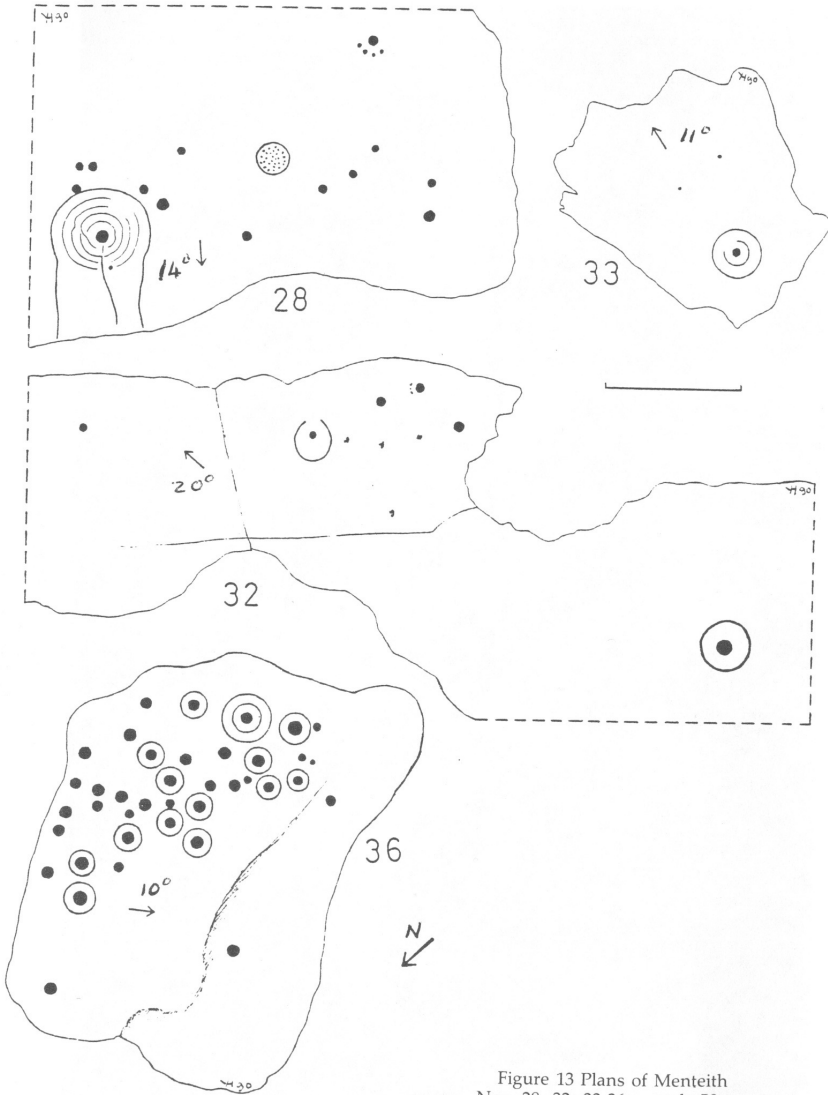


Figure 13 Plans of Menteith  
Nos. 28, 32, 33, 36 - scale 50 cm



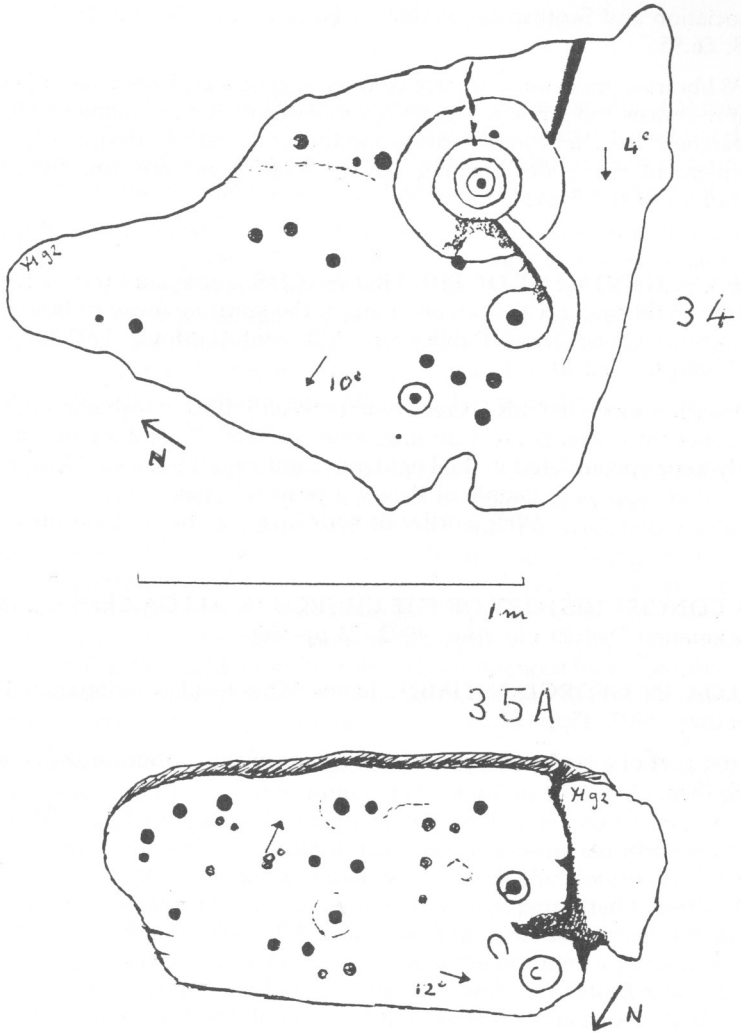


Figure 14. Plans of Mentheith Nos. 34 and 35A—Scale 1m

RECENT BOOKS

EXPLORING SCOTTISH HISTORY: a directory of resource centres for Scottish local and national history. Michael Cox, editor. Scottish Library Association and Scottish Local History Forum. 1992. 165 pp. ISBN 0 900649 49 8. £6.95.

238 libraries, museums, archive centres, societies are briefly described with their resources and services - gateways to a wealth of information for students, researchers, teachers and general inquirers. A useful, desirable guide to complement the wider ranging, larger *Scottish Library and Information Resources* of the SLA.

THE ENCHANTMENT OF THE TROSSACHS. Some fairy traditions of the district, published on the tercentenary of the spiriting away of Robert Kirk. Louis Stott. Creag Iterach Publications, Milton of Aberfoyle. 1992. 32 pp. ISBN 1 874585 00 8. £2.40.

Describes Kirk's life, his *Secret Commonwealth*, Bible transliteration, literary influence on Walter Scott, Cunninghame Graham . . . and a guide to fairies likely to be encountered in the Highlands, and who 'took away' Kirk in 1692.

People of Peace! a peaceful man,  
Well worthy of your love was he            from A. Lang

A CONCISE HISTORY OF THE CHURCH IN ALLOA Charles J. Palmer. Clackmanan District Libraries. 1992. 23 pp. 80p.

ALLOA IN GEORGIAN TIMES. James Whitehead. Clackmannan District Libraries. 1992. 45 pp. £1-50.

First part of a series of reprints of writings of the author, an Alloa man of 1807-1886.

PEOPLE OF THE FORTH (6)

SAINT MARGARET, QUEEN OF SCOTLAND

Stewart M. Macpherson Minister Emeritus, Dunfermline Abbey

Saint Margaret of Scotland died in Edinburgh Castle on the 16th of November 1093 at the age of forty seven. On the eve of the 900th anniversary of her death it would be appropriate to begin by remembering her birth in far-off Hungary and early days which prepared her so well for her future life as Queen of Scots.

Much has been written about her life after her marriage to King Malcolm III (Canmore), who succeeded in uniting the warring tribes of the land and creating a single Kingdom of Scotland. There have been published studies about her saintliness; her generous gifts to the Church; her bringing of the old Culdee Church in Scotland into the Church of Rome; her care of the poor; and her radical enrichment and refinement of the Scottish Court. But little has been written about her origins and her early life - the period prior to her arrival at the Court of King Malcolm.

Margaret was a princess of the Royal House of Hungary. Hungary and Scotland in the eleventh century had a lot in common. They were both small countries, both comprised many warring tribes, and they were both made into united kingdoms by the hard road of strong leadership and religious fervour. Princess Margaret's grandfather, King Stephen, played a major part in the development of Hungary and King Malcolm III (her future husband) a similar role in Scotland. They were both men of strong personality and commanded powerful armies. Both had a robust faith which influenced their statesmanship and inspired their respective peoples. How the two countries became connected is seen by going back two generations.

Edmund Ironside, King of the Anglo-Saxons and of England (980-1016), lost the fierce war with King Cnut (Canute) of Denmark in 1016 and had to agree to share his kingdom, taking the south while Cnut had the north and the east. This resulted in his two sons, Edmund and Edward being banished from the land. They first fled to Sweden and took refuge there, then journeyed through Europe until they came to Hungary where they were permitted to settle. King Stephen I of Hungary (966-1038), canonised in 1083, and regarded as the greatest Magyar hero and national saint, gave the brothers a portion of land known thereafter as the 'land of the English', and they found a new home in the Castle of Reka. The hill on which the castle stood is known to this day as the 'Hill of the English Virgin'. Historians have identified the place as an area in the Mecsek mountains near Mecseknadasd, east of the city of Pecs, and archaeologists have uncovered evidence of the castle, a monastery and a village whose houses were scattered around the base of the hill. In the Parish Church of Mecseknadasd, Saint Margaret is remembered and so

venerated that a statue in her honour was raised there in December 1971.

Shortly after the young brothers' arrival in Hungary Edmund died at the age of sixteen, and in due time Edward married Agatha, daughter of King Stephen. Thus the royal families of England and Hungary were joined. Edmund and Agatha had three children, Margaret (born around 1045), Christine and Edgar. It was this Margaret who was to become the Queen of Scots and a Saint of the Roman Church.

Margaret having been brought up in a royal household was accustomed to the style and atmosphere of the courtly life. She lived and was educated in a small country split by warring tribes but united by the saintly rule and example of her grand-father King Stephen. Her mother was the daughter of a king; her father was to become heir apparent to the throne of England since his father King Edmund II had died in 1016, and half-brother Edward the Confessor was elected King of England in 1042. Like Margaret and King Stephen Edward was canonised in 1161 by Pope Alexander II, so there are three saints in this short story! With this ancestry on both paternal and maternal sides and her courtly training, Princess Margaret was well prepared for life at the court of the King of Scots, where she was to preside for twenty three years with firmness and compassion.

King Edward the Confessor had invited Margaret's father and family to return to England from Hungary with a view, maybe, to Edward's succeeding to the throne; and they came with the blessing and rich gifts of the Holy Roman Emperor he had served so well. But Margaret's father, the Exile, died in mysterious circumstances, which meant that her young brother Edgar, known as Edgar the Atheling, was now perhaps the heir apparent to the throne of England. During this time Malcolm, later Malcolm III King of Scots, was in exile from Scotland, since MacBeth had taken the throne by murdering his (Malcolm's) father Duncan. Under the protection of Siward, the Earl of Northumberland, Malcolm visited the court of Edward the Confessor on several occasions and came in contact with Agatha and her three children. These were the first of several meetings that Malcolm and Margaret would have; at that time she was scarcely in her teens.

Edward the Confessor died in January 1066 and his first minister Harold, Earl of the West Saxons was crowned King; not Margaret's brother Edgar. However William the Conqueror challenged the throne and took it from Harold by the battle of Hastings. So Edgar Atheling's position as a Saxon Royal claimant became hazardous. He tried to fight the Conqueror and Malcolm staunchly supported him in this, gaining a notable victory in Northumberland. Near the end of 1068, however, Edgar being defeated by William at York decided that the Conqueror was no longer to be challenged, and for the safety of his mother and sister Margaret, he should become an exile like his father - in Hungary or in Scotland where he would find sanctuary with his friend Malcolm. His sister Christine had by this time entered a Benedictine convent at Romsey.

The traditional story of their arrival in Scotland is that they had intended to return to Hungary but their ship encountered a severe storm and was wrecked on the north shore of the River Forth. There they were received and welcomed by Malcolm, now King Malcolm III, and brought to the safety of his fortress home in Dunfermline, capital of Scotland. But another theory now held by scholars has a more likely explanation. Had Edgar intimated that he intended to retreat to Scotland where he would undoubtedly have gained the armed support of William's enemy Malcolm, William would have made a determined effort to stop him, and his mother and sister would have been in jeopardy. So he made it known that he was returning to his native Hungary (a natural decision for a defeated exile), but in fact he intended all the time to go to Scotland. Whether his ship was wrecked in a storm in the Firth of Forth or not the important fact was that he and his family did land on the north bank of the river and were warmly welcomed by Malcolm. The year was 1069, the place near to the site of Rosyth Castle. The name Rosyth is probably derived from the words *ross* and *hythe*, meaning a spit of land and a jetty or landing-place respectively. If this is the exact spot where Princess Margaret landed, then the bay beside it is well named Saint Margaret's Hope in memory of her.

It is said that on her way to Dunfermline, Princess Margaret rested against a large stone by the road-side until she had regained her strength sufficiently to continue her journey. In pre-Roman times there had been a Druid Cromlech or circle of standing stones close to this spot, and it is believed that this stone is the last remaining fragment of that Cromlech. The stone can be seen at the side of the road between Dunfermline and Rosyth, and is known as Saint Margaret's Stone. It is strange that the ancient pagan religion and the new Christian faith should be thus commemorated in the same stone.

Malcolm took the exiled family to his Tower or fortress. It had been built on a spur of land (a *dun*) with a narrow, steep approach; to the south was a broad stretch of marshland, to the west a dense forest, to the north a precipitous drop down to the *lyn* or burn that flowed around the base of the hill. It was a fine defensive position. The fortress itself was several stories high with at least twenty main halls or rooms and many smaller apartments for servants. The base was 11 metres by 10 (35' 6" x 31' 4"), the topmost part of the structure widening out considerably. The remains of the foundations of this fortress can still be seen in Pittencrieff Park.

The first time Malcolm had seen Margaret at the court of Edward the Confessor she was a girl of twelve, now she was a beautiful young woman, and on the day after Easter in 1070 they were married in the little Culdee Church in Dunfermline. There they made their home in Malcolm's Tower, as his fortress was called. There Queen Margaret gave birth to six sons and two daughters. There she began her true life's work.

Agatha and her family were not of course the only exiles from the Norman Conquest. A great number of people, many of them from distinguished English families, were so disillusioned with the rule of William that they too came to Scotland and found refuge here. It is unlikely that they would have been

granted asylum in Scotland had it not been for the welcoming spirit shown by the new Queen. This had its benefits for the nation, for the English brought with them many of their arts and crafts, some unknown in Scotland. Queen Margaret encouraged the strangers to cultivate their arts and establish their culture. Thus the Anglo-Saxon language became known wherever they lived and in many places superseded the local Gaelic. The loss of the Gaelic, especially along the coastal areas, was a blow to Scottish culture, nevertheless the coming of their skills and crafts did much to increase the country's commerce and trade.

At the marriage of Malcolm and Margaret it became clear that the little Culdee Church was much too small, many of the distinguished guests at the royal wedding having to stand outside during the course of the service. But the site was specially precious and sacred to Queen Margaret. Soon afterwards, therefore, she decided to replace it with a fine, large Church, more in keeping with the new forms of religion which she was seeking to introduce, and more suitable for the capital township of Scotland and the place of worship of the royal family. Work began at once and by 1072 her new Church was completed and dedicated to The Holy Trinity. It was built over the old Culdee Church, and so the ancient site was preserved as a place of Worship. At that time it was reckoned to be the largest and finest Church in the land.

While Queen Margaret replaced the Culdee Church with her own Church of the Holy Trinity which followed the Roman usage, she did not altogether displace the Culdee clergy. Indeed she maintained a close friendship with many of them, visiting them in their monasteries and discussing religious matters with them. Sometimes she sought their advice and counsel, and in the course of her reign she gave generous grants of lands and monies to them. One of her great loves was books, and some of the devotional volumes she liked best she had decorated with gold and precious stones. One of the great works of the Culdee monks was the transcribing of books, and the Queen encouraged them and so acquired a fine library of sacred volumes. It was only in later years that serious disputes arose between the Culdee Clergy and the Roman Church, and finally in 1250 the Culdees ceased to exist as a organised body: more than a hundred and fifty years after Margaret's death.

Queen Margaret loved her Church deeply and in the course of the years she richly endowed it with vessels of gold and silver, and with precious stones. One of her special gifts was known as the Black Rood, a beautiful cross studded with diamonds which she had brought with her from her native Hungary. She not only enriched her Church, but also the life of the Court. She herself dressed in robes of bright colours and she encouraged the women-folk to do likewise, adding much-needed colour to royal occasions. She introduced gold and silver table-ware to the royal dining hall, thereby adding some magnificence to court feasts. She was distressed by the disorderly behaviour of the courtiers at table, and sought to suppress it by introducing a Grace at the close of meals. This was not met with great enthusiasm until she proclaimed that the Grace would be accompanied by a Grace-Cup, a cup of wine passed round the company in token of their fellowship together! In the course of time this came to

be known in the homes of ordinary folk throughout Scotland as I ho Loving Cup, and is still practiced in some places.

Queen Margaret's care of the poor is legendary. It is said that she prepared food for nine orphan children each morning and fed them herself; every evening she washed the feet of six children in an act of self-abasement. Each day she gathered crowds of poor folk at her table and fed them, waiting table herself. By acts such as these she endeared herself to the people of Dunfermline, and they worshipped the ground she walked on. Her practical care of the poor was out-matched only by her own personal life of devotion. She attended every act of Worship, heard masses in private and public, observed all fast days and devoted herself to hours of private prayer. She sought regular times of prayer and devotion but could seldom find peace in the hectic rush and bustle of the court. In seeking some quiet and seclusion she discovered a cave close to the Tower Burn, some three hundred metres from her home. It was about 2 metres wide (8' 6") and, from the entrance to the rear of the cave 3 metres (nearly 12'), part of this being passageway. It was just over 2 metres (6' 9") high. For her it was an ideal place for private devotions for it was secluded and peaceful, and she used to go there daily to pray. It is said that Malcolm became suspicious of his wife's frequent absences, and one day followed her; only to discover that she was engaged in her devotions in the cave. He was so ashamed of having doubted her that he had the cave furnished as an oratory. The furnishings no longer exist, but the cave may still be seen, and in this 900th anniversary year it is to be lit and made accessible to visitors to Dunfermline.

The Queen was anxious to establish suitable social graces amongst her women-folk so she gathered them around her and taught them to sew and embroider. When the ordinary folk of the town saw the beautiful work they created they too sought instruction in the art. She was also eager to teach them good manners and lady-like behaviour. This required a more severe attitude, but it was always tinged with kindness; so the appearance and the attitude of the court ladies improved considerably.

In order to enhance the appearance of the King's majesty she persuaded Malcolm to add greatly to the number of his courtiers and attendants. While this would impress those who were entitled to visit the Royal Court, it did not have any influence on the ordinary people. So the Queen encouraged her husband to make more public appearances throughout the land so that ordinary people might see him and his brightly clad courtiers. This did much to impress and to establish loyalty.

Queen Margaret was not content to restrict herself to the matters of the court and community. She played a considerable part in national affairs also. It had always been Malcolm's aim to unite the traditionally warring tribes of Scotland into one strong nation. He being a battle-hardened soldier had done a great deal to create a united army in Scotland, but unity requires more than this. His Queen had already shown her passion for a higher culture and a richer religion, and it was the addition of these aspects of national life that

helped to establish a closer understanding between tribes and, therefore, a more stable unifying force. Moreover her passion for justice and mercy helped to soften the more rigid application of the law and so claim a readier allegiance from ordinary people.

Because of Margaret's love of precious goods and beautiful things, she encouraged the importing of many exotic wares. This was the beginning of a wider trade and commerce, and helped to expand the economy of the country. Her humanitarian interests drove her to seek out the poorest in the land and those who were most harshly treated as slaves. To the poor she gave money and food. For the slaves she interceded and on many occasions paid their ransom and set them free.

In the early days of her reign the Queen sought to encourage pilgrims to cross the Forth and travel north to Saint Andrews to visit the shrine of the Apostle. With this in view she had piers or jetties built on the north and south banks of the River Forth and instituted a ferry service, free to all pilgrims -the two landing places have developed into today's North Queensferry and South Queensferry. In 1164 the rights to the ferry were granted to the monks of Dunfermline Abbey. Later in 1821 engines replaced oars, and in the 1930s car ferries were introduced. These still functioned long after the construction of the Forth Rail Bridge, and were only supplanted when the Forth Road Bridge was built in 1964. Appropriately the new bridge was opened by Her Majesty the Queen, herself a descendant of Saint Margaret.

On the 13th of November 1093 Malcolm was killed in battle at Alnwick Castle, and his eldest son, Edward, heir to the throne, was mortally wounded. By this time the Queen was ill and had been taken to Edinburgh Castle for safety, since the usurper Donald Bane was already gathering a rebel army. When she heard the news of the death of her husband and son she died. The little Chapel in which Queen Margaret worshipped is the oldest part of Edinburgh Castle, much visited and known yet as Saint Margaret's Chapel.

Queen Margaret's body was brought back to her own Church of the Holy Trinity in Dunfermline and buried before the High Altar. The outline of the walls of the old Church of the Holy Trinity are clearly marked on the floor of the great Norman Nave which was constructed over its site, and beneath the floor the foundations of Queen Margaret's Church have been preserved and made to be seen through iron gratings. It is quite possible to make an enlightened guess as to the exact spot where she was buried.

In later years her son David I replaced his mother's Church of the Holy Trinity with a magnificent Abbey, the Nave of which still stands as one of the finest examples of Norman architecture in Scotland. This meant, however, that the body of Queen Margaret now lay buried, not at the High Altar of the new Abbey, but close to the Rood Screen in the Nave.



Clearly this was deemed to be unsuitable, especially when in 1249 Margaret was canonized by Pope Innocent IV and officially enrolled in the Papal Catalogue of Saints. It was thought that it would be more appropriate to build a new shrine at the east end of the Abbey and have her body removed and reburied there.

This shrine was completed in 1250 as an exquisite addition to the great Abbey, and on the 13th of July 1250 the remains of Saint Margaret were exhumed and carried in solemn procession to their new resting place. It is said that as they passed the place where her husband Malcolm lay, her bier became so heavy that it was impossible for the bishops and abbots to carry it further. It was decided that this indicated that Saint Margaret was not content to rest apart from Malcolm, so his remains were also exhumed and carried with her to the new shrine where they were re-interred together. Thus the King and Queen who had together done so much for Scotland and the Church were laid to rest side by side. The marble slab that covered the tomb can still be seen outside the east end of the Abbey Church, and the base of the walls of the shrine and the pillars that supported the roof are also visible. Jn lglg thfi mmg of thg Choir of David I's Abbey, (or Conventual Church as it was called) were cleared away and a new Parish Church was added on to the Norman Nave. This is the structure now known as the Abbey Church of Dunfermline. In it can be seen many mementos of the Queen who was responsible for the foundation of the Abbey.

A stained glass window in the south transept commemorates her marriage to Malcolm; plaster heads of Margaret and Malcolm are set at the top of the pillars around the building; the emblem of the Cross and Martlets (the Coat-of-Arms of Edward the Confessor which Margaret inherited) are stitched on the pulpit falls, engraved on a plaque on the front of the gallery, and may also be seen on the strip of heraldic emblems which surrounds the building high above the galleries. In the Norman Nave there is a stained glass window above the west door which depicts Margaret along with Malcolm, Wallace and Bruce.

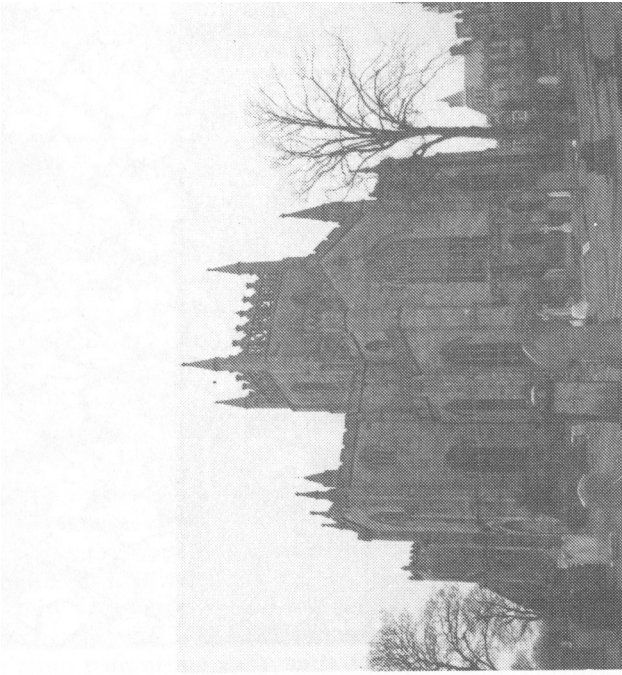
So in the course of her comparatively short life, Saint Margaret left an indelible mark on Scotland in terms of culture, social graces, trade and commerce. She exerted a great influence on the Royal Court in dress, status, dignity and decorum. She showed a personal example of the care of the poor and the freedom of slaves, and encouraged the spirit of mercy and justice in the courts. But above all she influenced the religion of Scotland by the building and enriching of her Church, and the introduction of the Roman usages in worship. Many of Saint Margaret's innovations have been for the permanent benefit of the nation, others have been described as the destruction of Scotland's heritage, culture and religion. But, however her life and work are seen, it has to be admitted that few people have accomplished so much in so short a time.

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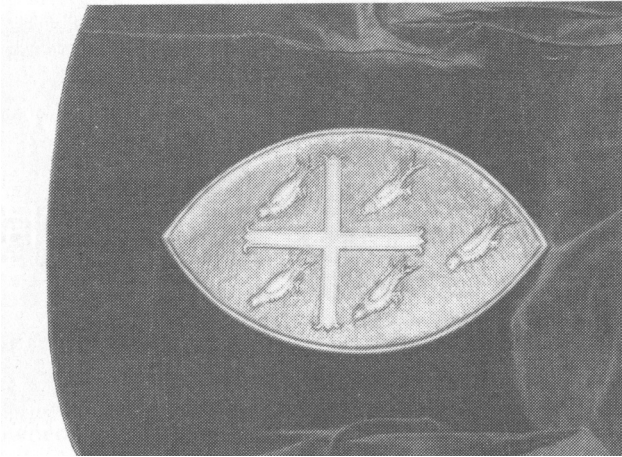


St. Margaret's Shrine  
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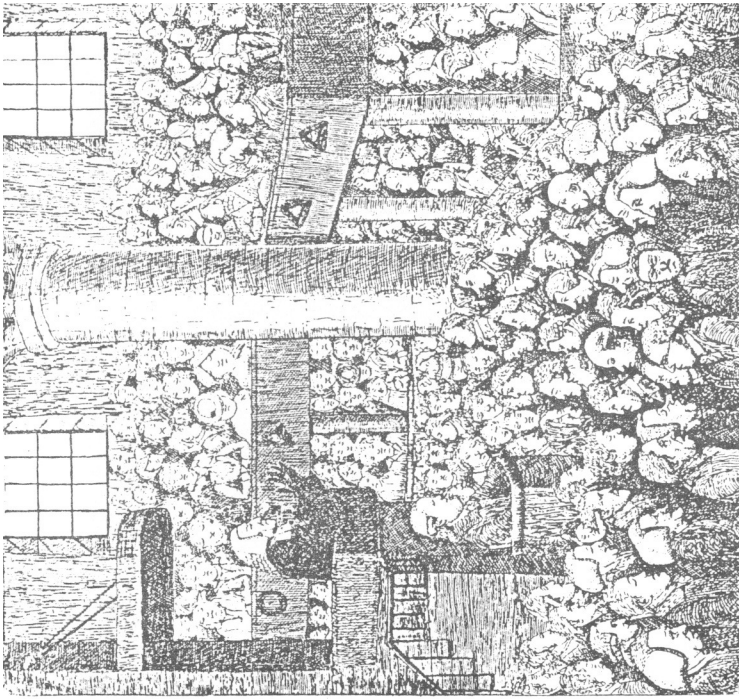
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Dunfermline Abbey



Cross and Martlets Coat of Arms

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Figure 3. A rare drawing of a Church interior of 18th century: Tolbooth, Edinburgh in 1785.

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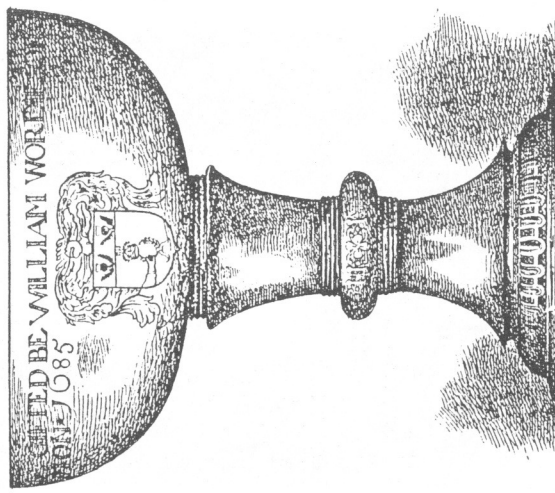


Figure 1 St. Ninians Communion Cup (1685); from Old Scottish Communion Plate by Thomas Burns, Edinburgh, 1892

1EIGH

## TEENTH CENTURY OCCASIONS

### 2Communion Services in Georgian Stirlingshire

3Andrew T. N. Muirhead

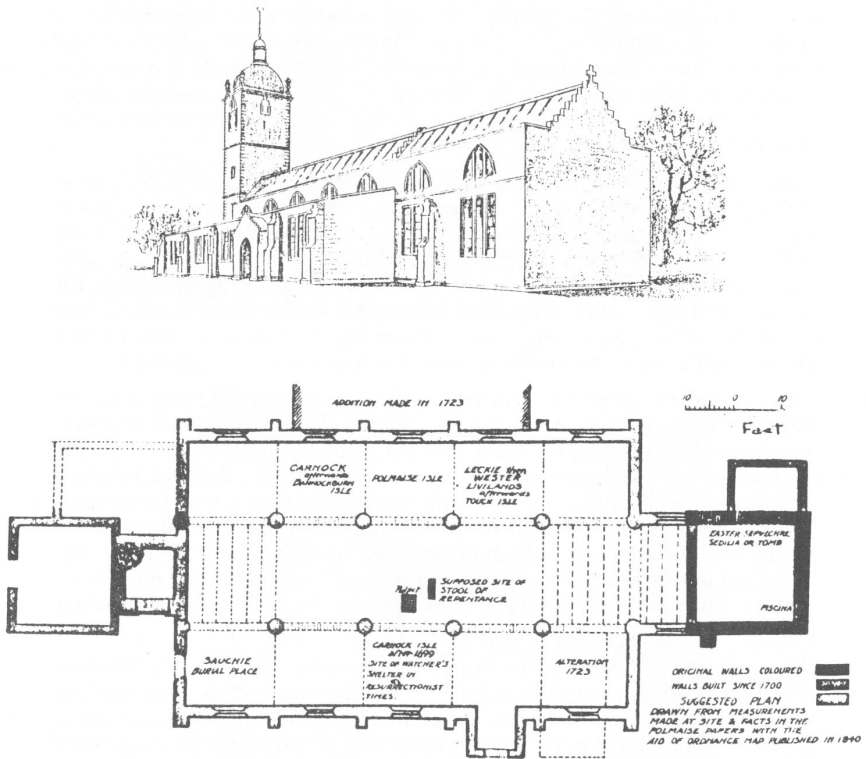
Little has been written about the conduct of eighteenth century communion services. Few writers on the period have looked beyond the brief description given in Burns' 'Holy Fair', which describes in graphic and uncomplimentary detail, such an occasion in the Ayrshire village of Mauchline in the 1780s, or the more detailed accounts of Henry Grey Graham's wide-ranging, if biased, *Social Life in Scotland* in the Eighteenth Century, which draws material from a host of published sources, mainly written by ministers, in the form of memoirs or polemics. (1) This is a pity, for other information is available, and one particularly interesting account has been almost totally neglected; an account of a service witnessed by the Earl of Oxford in 1725 in the Stirlingshire village of St. Ninians, published by the Historical Manuscripts Commission in 1901(2) and reprinted as an appendix to this paper.

The author, probably chaplain to the Earl, wrote his journal of *A Tour to the Northern Counties and Scotland* to record his experiences whilst accompanying the Earl and his retinue of ten servants northwards in the spring of 1725. As an English Tory and hence high Church of England, he was totally out of sympathy with what he saw, and of course the style of the celebration was quite foreign to him. The whole account has something of the flavour of one of the more patronising early anthropologists. However, because the proceedings were so unfamiliar to him, nothing is taken for granted.

The group arrived in "St. Nynians, a little village this side Stirling, vulgarly called St. Ringans" late on a Saturday. They had been travelling for eleven hours that day and the only break that they had had was "A glass of wine the Governor of Stirling entertained us with, who seems a civil well-behaved man though a stiff Presbyterian". This 'stiff presbyterian' was Lieutenant-Colonel John Blackadder, son of a well-known covenanter and himself a prominent layman in the Church of Scotland, well known for his piety. His diary and letters were published in two separate volumes in the nineteenth century, but sadly there are no entries covering the end of May 1725 when Oxford met him.(3)

The village of St. Ninians was but a small part of the parish of St. Ninians. It had an extent of around 10 miles from east to west and six from north to south. A prosperous parish, it was one of the early areas to undergo agricultural improvement and enclosure, with the result that even by the 1720s many were leaving the land and settling in a number of villages within the parish. The land was owned by a considerable number of relatively small proprietors who comprised the heritors of the parish church.

W.B. Cook, (4) attempted a reconstruction of the church, with putative plan and elevation (Figure 1) based on surviving fragments, documentary sources, and a little imagination! He showed how the church had been in poor condition around the year 1722 so that major works were essential to make the building weather-tight. In this process the church was enlarged, and a new aisle was being built at the time of Oxford's visit. This caused conflict amongst the heritors who had to meet a substantial part of the bill for a parish the size of St. Ninians with over 5000 of a population; the church could hold less than 1,000. Shortly after Oxford's visit the tower was



removed and the present one built at a cost of £1200 Scots (£100 sterling).

Figure 1 St. Ninians Parish Church c. 1740: from W. B. Cook in *The Stirling Antiquary* Vol. IV - sketch and "reconstructed" plan.

At that time, and indeed for the next 150 years, few if any of the parish churches in Scotland celebrated communion more than once a year. In some parishes long periods went by without the sacrament; it was said of the parish of Muckhart that Archibald Rennie, minister from 1734 to 1786, never once dispensed the sacrament in 52 years, (5) and although such gaps were unusual, gaps of two or three years were very common; the neighbouring parish of Stirling for example suffered an interval of five years in the 1730s. In St. Ninians however, records show that communion was an annual event held in early summer.

1As a direct result of the infrequency of celebration, the habit grew up of 'vaiging', i.e. of attending as many services in neighbouring parishes as possible. This was officially deprecated but was very widespread. Because of it, attendances could reach into the thousands although not everybody took the sacrament. Many were present for entertainment and social intercourse rather than spiritual uplift. Robert Wodrow, minister of Eastwood near Glasgow wrote to a colleague in 1729:

"We have many irregularities in the celebration of that holy ordinance that cannot yet be rectified, at least not soon especially here. I live in a neighbourhood of the city of Glasgow and we have influences and multitudes. Perhaps I may have about 300 of my own charge who are allowed to partake and yet we will have a thousand, sometimes eleven or twelve hundred at our tables."(6)

Such numbers meant that church buildings were totally inadequate and much of the service was held in the open air. In St. Ninians this would be exacerbated by the building work in progress. Most of the people involved were therefore outwith the church building for most of the time, hence the need for the annual sacramental occasion to be held in summer, and there they listened to a succession of ministers preaching from a wooden 'tent' or portable pulpit kept for the purpose.(7)

The St. Ninians tent had been made as part of a general refurbishment programme in 1698 and was made of wood and green leather at a cost of £29 16 shillings Scots. By 1725 it was reaching the end of its useful life, for two years later the Session minutes report:

"It being reported that the tent pulpit they formerly had was broken and altogether unfit for any business, they appointed a new to be made and got ready against the Sacrament which is to be administered the 11th current."(8)

A number of ministers almost invariably took part, leading in turn to empty pulpits in neighbouring churches, and hence again to large attendances where the service was taking place. In many cases, the assisting ministers might be theologically at one with the host minister. In others, as in Burns' 'Holy Fair' a whole range of opinions and abilities might be found, from the 'yill-minister' whose arrival in the preaching tent sent the congregation to the ale-booths, to the 'kail-pot preacher' who would hold his audience so entranced that they were oblivious of the Sunday dinner simmering in

the pot.(9) Whatever the English visitors may have thought of him, the preacher they saw was no 'yill-minister' for the audience "stood it out with great attention", notwithstanding the author's view of them as "the very meanest sort of people that this country could show".

While the succession of sermons continued outside, the church was the scene of the actual sacrament. The centre of it was cleared of all the 'desks' or pews which normally cluttered it. These were private and saleable property, not part of the fabric of the church. In St. Ninians it was recent policy for new desks to be allowed only on condition:

"That they always had full room for an entry, put up their seats and remove them at Sacraments and burials upon their own expense, which is to be the general rule for all seats in the area."(10)

In place of the desks were ranged trestle tables, presumably also those ordered in 1698, which allowed the congregation to be served 50 or more at a time.

The various sittings or 'tables' were served by different ministers. It happens that Lord Oxford and his entourage witnessed the first table of the day and therefore saw the local parish minister. The guest ministers would normally have taken over later. If Grey Graham is to be believed, some ministers would have difficulty in getting their 'table' filled, while for other more popular ministers there would be real competition for places. (11) It was not always the case that ministers shared the task; it is recorded that John Carstares at Cadder once served 16 tables himself, a real marathon effort.(12) Of course when the local minister was unpopular, the whole occasion took on a different atmosphere, as happened in the Laigh Kirk of Glasgow in 1729:

"When Mr. Wishart came in to the pulpit there was but a very few for it. He intimated his surprise and earnest pressed that it might be filled. Some endeavours were used by the elders but few came. After prayer before sermon he gave another warning with the same success. After sermon and prayer he gave a long discourse on this and earnestly pressed that communicants might come forward, but nobody stirred. After he came down to the table it was not half full and he expressed his concern and signified how indecent it would be if the work should be ended with the first table. That he would sing a little before he began to serve and if in the time of singing the table did not fill he would close the work. All this dealing did not prevail until after singing more than three double verses people began to come out of their seats and some persons of distinction rose out of their seats and filled the table. They had four more and that was all."(13)

The St. Ninians service began with what the author of the Harleyan manuscript called the 'earnest sermon', normally known as the 'action sermon'. This would take an at least hour, although Ralph Erskine of Dunfermline was reputed to have preached for four hours on occasion.(14) This was followed by the process of 'fencing the table' when the minister 'gave the discharge', pronouncing the people who were forbidden from taking communion. That



process would already have started some weeks previously with the giving out communion tokens. This was done either by the minister himself touring the parish catechising his flock to establish their worthiness, or by the ciders. The actual distribution was done at the Fast Day service, normally held on the Thursday preceding Communion Sunday.

How many tokens were given out in St. Ninians in 1725 is not known. One thousand tokens were ordered in 1698 when the preaching tent was ordered. In 1730 as many were ordered 'as will serve the parish' from Walter Irons, coppersmith, who was also to make new beggars' badges. (15) At this period however it was also common practice for tokens to be given to the ministers of neighbouring parishes for the use of their parishioners. A decade later, in Stirling, some of the elders took exception to the way in which Ebenezer Erskine conducted the preliminaries to the Sacrament and protested to the Presbytery: "There was taken such unprecedented yet irregular steps both in the admission of communicants, the distribution of tokens and invitation of ministers to assist, as has given great grounds for offence... that a thousand persons that would have joined in this congregation... refused and drew back to join."

One of the Stirling elders, Harry Allan, refused to distribute tokens unless he were given enough for "his friends and acquaintances in town and country" He and his allies on the session claimed the process was the prerogative of the Session and to give the duty to the minister was foreign to the practice of the Church of Scotland. (16)

In the nearby parish of Alva, the distribution of tokens also encompassed a number for neighbouring churches. In 1724 the minister announcing the distribution of the tokens for their own Sacrament on the 26th of July, said that since the Sacraments at Dollar and Tillycountry were on the 19th of July and the 5th of August respectively, "such as were resolved to join those parishes, he would give them tokens, he being employed to assist." (17)

After the fencing of the table the tokens were collected, and only in extraordinary circumstances would anyone without a token be admitted. In some churches too, the tokens might specify which table the communicant was to attend, but this was more characteristic of the nineteenth century. The account shows its author to be singularly unimpressed by the style of the administration of the elements. His "shoving along the tables" echoes Pennant's comments some decades later:

"As many as possible crowd on each side of a long table and the rlcim ni are sometimes shoven one to another." (18)

The bread was presumably in slices; the diced bread which is now virtually standard was characteristic only of Aberdeenshire and the north-east at that time. The account specifies wheaten bread as distinct from the oatbread which was sometimes found. The nature of the wine is not described; but claret is most likely. Port was a later variant, sack an earlier

one. Ale was not unknown in particularly poor parishes, even whisky was recorded at an episcopalian eucharist in 1745, but that was probably a unique occurrence caused by circumstances. (19)

As a result of the large attendances, the cost of the elements was considerable: indeed, elsewhere some ministers blamed the lack of regular celebration on the poverty of their congregations. St. Ninians was well placed; prior to the '15 Rising the elements were normally supplied by the chief heritor, the Earl of Mar. Even after his defeat, exile and attainder, his factor in the area, John Watson of Thirtyacres, continued to provide what was necessary. It is recorded that for the 1698 communion service 41 pints of wine at 20 shillings scots per pint and 19 loaves at 12 shillings were required. (20) The communion plate used was not described, but three cups in use then are still in use today (Figure 2). These cups have the shallow wide bowl characteristic of seventeenth century cups and had been made in Edinburgh, two in 1670 and one in 1685. They had been donated by local people and their being made in silver shows a degree of prosperity; many churches had to make do with pewter. (21)

The established church in the eighteenth century was very dependent on the heritors who were local landowners. They paid the stipend, paid for the upkeep of the church, paid the parish schoolmaster, paid for the communion elements. The people were asked for very little other than the offering taken up at the sacrament, which was almost invariably set aside for the parish poor fund, administered by the kirk session. The thousands present at the St. Ninians communion service of 1725 gave for the poor of the parish the sum of £166 Scots (£13.83 sterling). Some of this was disbursed almost immediately with £47 being split among "47 poor persons given in a list that were not pensioners", £6 Scots and 4 shillings sterling going to a woman in Alva, and sixpence to a man in Falkirk. (22)

In general the seceding churches in the presbyterian tradition retained the traditional style of communion service with appropriate amendments. The Stirling Anti-burgher Congregation, a further schism from Ebenezer Erskine's original secession, came into being in 1747 over the question of the morality of taking the burghess oath imposed after Culloden. The anti-burghers were at first particularly strict, but in the context of Stirling itself, they were a small and gathered group. Most of the seceders remained loyal to Erskine's 'burgher' congregation. Nevertheless, by 1754 the congregation felt ready to hold the sacrament for the first time. They held a 'day of fasting and humiliation' simply to help them determine the date of the occasion, which was to be the 27th of October. Next to nothing is recorded about the administration of the Sacrament; however the distribution of the tokens is described minutely. A list of potential communicants "as had conversed with the minister" was given and each name attested by the appropriate elder. Rather fewer than 250 names occur and of these some 60% were women. However the habit of going round neighbouring sacraments pertained with the anti-burghers too, although the mechanism for distributing tokens is not mentioned. The following year there were sufficient of the Stirling kirk session present in

Buchlyvic for the sacrament to summon a session meeting, apparently without notice.

Fencing the table was practised, as might have been expected, and it is interesting to see one of the elders barred from "joining in or serving at a sacrament" on account of his intimating a roup or auction on a Sunday at the parish church. It is not clear whether the complaint was made on Sabbatarian or sectarian grounds; what is clear is that seceders were frequently witnesses at the sacrament of baptism in the established church and vice versa.(23)

Prior to 1745, Scottish Episcopalianism tended to follow a similar pattern to the established church, but on a smaller scale. A long-standing controversy existed between the 'Usagers' who used the old fashioned extempore Scottish style of liturgy, and the 'Anti-usagers' who adopted the English liturgy. This schism was almost as complete as those within the presbyterian church at the time. The episcopalians also used communion tokens, and their communion celebrations gradually increased in number from once a year to four times a year by the time of the last Jacobite rising. Here too, moral offenders were re-admitted to the sacrament only after penance, while neighbouring priests took part in the services and preparatory services were held similar to the presbyterian model. Only after 1746 did the expression 'Holy Eucharist' begin to be used by the episcopalians. The episcopal priest who covered Stirling and St. Ninians was one Ninian Niving. He owed his position to the Jacobite lairds, including Murray of Polmaise, and functioned, so it seems, from a small chapel near Torbrex.(24)

The visiting episcopalians in 1725 were clearly not impressed by their first sight of a Scottish communion service; indeed such a service would be very strange to us today. It is easy to draw parallels in the mixture of drink and religiosity with the slightly schizoid nature of Scottish society which has been a feature of its literature from Scott and Hogg through Stevenson to Robin Jenkins. In the context of its time, however, the spectacle as described at St. Ninians was a regular aspect of Scottish life. Most accessible comment on the practice of communion in Scotland tends to be clerical in origin, but a body of writing does exist which shows lay attitudes to the services. One layman who wrote extensively on his attitudes to spiritual matters was that 'stiff presbyterian' whom the English visitors met at Stirling Castle, John Blackadder. He was probably not present on this occasion, but he did have a different view of the sacrament:

"I could not contain myself at the table, tears flowing out, which I strove much against: first lest onlookers should think better of me than I deserved, or think that I had what I had not; and again, I know my heart is deceitful and vain.... I sat in the church all day serene and calm. At night fatigued by the long exercise." (25)

Nonetheless at an earlier sacrament he had criticised the length of the service:

"We were kept very late, till my spirits were fatigued. I cannot approve of this way of managaing the affair and lengthening out the public exercises till we are made unfit for private duty.... But custom bears down all.(26)

As part of the pietist tradition, it may well be that Blackadder was not typical of the average church-goer of his time, nonetheless, his response shows that such services were by no means looked down on by educated Scotsmen. He had a particularly high opinion of the minister at St. Ninians "Aug 24th Sabbath: I often wish much to hear oftener our friend in St. Ninians. I had a grudge that I could not get him heard this day for fear of giving offence... I do not go where I am most edified for fear it will be taken amiss."(27)

Clearly the public position he held as Lieutenant-Governor of Stirling Castle laid him open to pressure which reflected the conflict between burgh and hinterland which was obvious at this time.

Blackadder does not comment on the sort of 'scandal' which made up so much of Burns' 'Holy Fair'; the English visitors obviously were aware of the reputation of sacramental occasions, but as can be seen from the appendix, saw no sign of disorder.

Obviously the reputation of this style of celebration was a matter of concern until it finally died out in the nineteenth century, at least in the lowlands. The Rev James Lapelle of Campsie discussed the matter in his contribution to the Statistical Account of Scotland in 1793:

"People have complained that the tent preaching was prejudicial: I am inclined to believe the contrary from experience: 1st on account of its bringing a considerable collection for the poor; and 2ndly it accustoms a number of people to meet together in a decent, cheerful and respectable manner. I have never heard either the sober or the serious, or the industrious, complain; and considering the simplicity of our service, in most other respects, I have all along been accustomed to consider these public religious meetings as beneficial to the manners of the country."(28) All the evidence suggests that of the thousands who attended the occasion in St. Ninians, and the author suggests 3000 already present and as many still on their way as the party left, the majority would not communicate and undoubtedly some of them were there for purely social reasons. It is interesting to compare this estimate with the population figures for 30 years later, when the population had certainly not shrunk. Webster's census gives a figure of 6451 for St. Ninians and 3951 for the neighbouring parish of Stirling. Of course, contrary to popular mythology, the entire population did not go to church every Sunday, far from it. Apart from the practicalities of accommodating 6451 people in one parish kirk, distances and lack of interest were also factors then as now. Thomas Boston described his border parish of Ettrick thus in 1710: "Our parish is not great, but our congregation is less by reason of the principles, passions and prejudices of not a few. But yet smallest of all is the company of ordinary hearers: when those are taken off that come once in twenty days, a month or six weeks; who are taken up with their beasts all the summer in the fields, and sleep at home with them all winter; yet some whose faces I seldom if ever can discern but when I surprise

them at their houses.(29)

One point that does arise from the eighteenth century communion service was its potential for a fairly spectacular conversion experience', Blackadder's weeping was a sign perhaps of a more than usually pious participant, but some 17 years after Lord Oxford's visit a wave of 'revivals' occurred. These characterised by various factors: the ministers involved were not known as charismatic preachers. The best known, William McCulloch of Cambuslang was freely agreed to be a 'yill-minister' whose appearance in the preaching tent sent people to the ale-booth, but in 1742 his congregation burgeoned and he invited George Whitfield to the communion service planned for the July.

It is recorded that 20,000 attended and 1700 communicated. A second sacrament was organised for 15th August; estimates of those present were as high as 50,000, an unbelievable figure, and even Whitfield's estimate of 30,000 seems unlikely; 3000 took the sacrament, a further 1000 failed to obtain tokens. The phenomenon spread into Stirlingshire, particularly to Kilsyth. Here in October 1742 the revival culminated in a communion service at which 1500 communicated at a total of 22 sittings.(30) After Kilsyth, other parishes were the scenes of similar events. At St. Ninians, for example:

"the number of the awakened must be considerable. The first remarkable appearance of this good work was at the giving of the holy supper, upon the first of this current August. There were several awakened upon the Saturday, many more upon the Lord's day both in the kirk during the action sermon, and the service, and also in the congregation in the fields."(31)

The minister, James Mackie, followed this up by giving 'instruction and direction' with apparently lasting consequences: "The Rev. minister of the gospel at St. Ninians... writes that impressions upon our people are far from wearing off, their behaviour is such that their enemies themselves cannot quarrel..."

This James Mackie was a noted 'moderate' and his appointment by the heritors of St. Ninians in 1734 was met with considerable hostility both within his own congregation and from neighbouring ministers. His achieving such popular results locally must have been very surprising. No such revival followed the service witnessed by the Earl of Oxford and his retinue. It was a normal 'occasion' in a typical parish. Of course they only saw a small part of the event; missing the fast-day, the Saturday sermons and the thanksgiving service on the Monday. All they saw was a small part of Sunday's events. Obviously the impression made was unfavourable; perhaps the last word should lie with the St. Ninians Kirk Session; on their meeting on the 27th May 1725 it was reported that:

"Everything was decently performed in celebrating the Sacrament of the Lord's Supper."(33)

## APPENDIX

Herewith pp 122-4 of reference 2 below, Oxford's 1725 - visit

It now began to grow duskish, and we hastened thence to St. Nynians, a little village a mile this side Stirling, vulgarly called St. Ringins. It was past nine o'clock before we got in hither, to a 'change' kept by one Cummins we were in continual motion for above eleven hours this day, without any refreshment but a glass of wine the Governor of Stirling entertained us with, who seems a civil well-behaved man though a stiff Presbyterian. It was about one o'clock before I went to rest, which gave me an opportunity of observing the Aurora Borealis here, which appeared at this hour, so clear and glaring as if the sun were just rising.

May 23.—Our being at this place this Sunday morning afforded us an opportunity of a sight which was curious enough for a stranger. It was that Meeting or Assembly of the members of the Presbyterian Kirk, which is by them termed an Occasion: and perhaps may be so called because the Celebration of the Sacrament is the occasion of such assembling together. There is notice given some time before hand when and where this Occasion is to be held, at which time and place (which is generally one of the Kirks most commodious for its largeness) the ministers of the several 'Parochs,' to the number of ten, twenty, or perhaps thirty sometimes, are desired to attend and give their assistance, according as their several parts are allotted to them of praying or preaching, which is to continue without any intermission both within the kirk and without it in some field adjoining for this whole day from morning to night. St. Ringins was the place appointed for this day's solemnity, and about ten o'clock we went forth to observe it; both the church and the field they were met in being within a bowshot of our inn. We first walked into that part of the open ground where they met to the number of many hundreds, and disposed themselves on a shelving ground facing their preacher, who held forth at the lower part of it, from a pulpit erected for that purpose. This part of the occasional assembly seemed altogether made up of the very meanest sort of people that this country could show. It was a rainy day, but they sat or stood it out with great patience and attention to what the twentieth part of them could not possibly hear one word of, or rather indeed I should say one sentence: for the preacher every now and then took care to lift up his voice at some particular insignificant word which might reach the ears of the greatest part of the congregation: the present preacher seemed an elderly and weakly man, but had a special knack at this elevation of tone when he saw convenient. I pressed on through the crowd, till I came so near that I could hear him distinctly, he soon satisfied my curiosity with a confused medley and jargon of words, uttered with great emotion; and I could not tell which to compassionate the most, the preacher or the spectators; for I cannot properly call them the hearers.

The field exercise seems to be contrived only as an entertainment and amusement to keep those poor people together, who cannot get into the church till room be made for them, by the retirement of some of those who crowd within it, so that they make a continual succession, whilst those who are tired of their entertainment within doors are glad of getting forth into the fresh air and a fresh

amusement, and those of the field are ready to succeed and take their places.

After seeing their disposition in the open air, we got into the body of the church by the favour of a porter who kept the door constantly shut, but when people had occasion to come out, or enter in. It was exceedingly thronged both in the body of the church and in the lofts or galleries; however, we pressed forward through the crowd till we came pretty near the pulpit where Master Loggin, the parish minister, was just upon the conclusion of his sermon, which was the first that day, and called the Earnest sermon: after which, having sung a psalm, he gave the discharge, that is, he generally pronounced the several sort of sinners whom he discharged or forbid from partaking of the Sacrament. After which a psalm was again sung, and then he came down from the pulpit into the body of the church (another immediately mounting up in his room) where some boards were laid for the whole length of it from west to east about two feet wide and the height of a table, and covered over with an ordinary linen cloth. The persons who were first to communicate, about fifty or more, sat on each side (but to the best of my remembrance were all uncovered). The minister stood about the middle of it, and after some short preface signifying to what purpose they were met on that occasion, he read to them that part of the chapter to the Corinthians from whence the Church of England takes the Form of the Consecration Prayer. When this was done the persons thereunto appointed went down on each side of the long table I before mentioned, and received the tickets from every person, that was sat down in order to communicate: for without producing such a ticket (token) no person was admitted. When these officers were returned with the tickets to the Minister who stood at the side of the table about the centre of the kirk, he proceeded to send the bread to the Communicants on each hand of him, it was shoved along the table on platters which held each of them several large pieces of wheaten bread, which the people took out thence, and divided every man with his neighbours that sat near him on the same side or over against him. After this followed the flagons with the wine, which every one took and drank according to his discretion. We did not stay within the kirk until this set of communicants were removed and the next sermon begun: for indeed the crowd was great and very troublesome to stand in for so long a time; though some people of a better sort who were placed in pews near the place where I stood very civilly invited me to come in and sit down with them, which could I have afforded to have stayed much longer, I should gladly have accepted: but my curiosity was by this time pretty well satisfied, and I was very willing to retire both on account of the various offensiveness met with in the common throng, and the disagreeable and shocking appearance their celebration of this duty carried in it, especially to those who thought they had great reason upon this sight to bless God for having been used to a behaviour very different both as to decency and reverence of it.

I am told there are frequent disorders amongst the poor people on these occasions, who being to make a whole day of it at the place where they meet cannot be supposed wholly to abstain from meat and drink, and sometimes to go to excess in the latter. But as I saw nothing of this kind, I cannot charge them with it. It was now about eleven o'clock in the morning, and if there

ever are any excesses of this kind committed it most probably must happen towards the evening; and indeed no wonder it should fall out so, where there are so many thousands of ordinary people got together, as generally attend these occasions, there being already at this place three thousand at least, besides great numbers that were continually coming on their way, and very probably there might be double the number before the close of the evening."

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## QUOITING IN CENTRAL SCOTLAND THE DEMISE OF A TRADITIONAL SPORT

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In one form or another, the game of quoiting dates back to at least medieval times. During the sixteenth century, we are told, it was practised by all classes of society. Subsequently, however, it became predominantly a pastime of the peasantry. The existence of a quoiting alley at the Bencluch Inn, Tillicoultry in the 1790s, and of newspaper references to matches between teams of eighteen players a side drawn from the inhabitants of Doune, Dunblane, Falkirk and Stirling in 1830, suggest that quoiting was still popular in Central Scotland in the late eighteenth and early nineteenth centuries.<sup>1</sup>

In the course of the 1830s, described by the *Stirling Observer* as the "quoit playing age", the popularity of the sport within the region increased dramatically.<sup>2</sup> "The ancient national game seems to be gaining much ground of late", it was reported in 1836.<sup>3</sup> During the 1840s and 1850s enthusiasm temporarily declined. But a further surge of interest began in the 1860s and by the close of the century quoiting was more popular with the inhabitants of central Scotland than it had ever been before. "The old game has made a great revival in west Perthshire and western Stirlingshire . . . nearly every village has its club and the game has almost entirely supplanted football", the *Stirling Journal* noted. (4' Between 1891 and 1900 the region boasted a total of 48 quoits dubs, one for every thousand male residents aged between 15 and 44, spread relatively widely throughout the area (Map 1). A Scottish Central Quoits League was established in April 1899 and a Stirlingshire Quoiting Association in November of the same year to standardise rules of play and further increase interest in the game through the introduction of competitive league and cup matches. Quoiting tournaments, attracting substantial numbers of entrants, were common features at Highland Games and other athletics events while matches between individual quoiters, usually for stakes of between £5 and £25 a side, regularly drew large crowds of spectators to the district's principal quoiting grounds.<sup>5</sup> On the face of it, the sport of quoiting seemed set for a healthy future. The reality was to prove very different.

In the absence of detailed records for individual clubs and bodies like the Stirlingshire Quoiting Association any attempt to trace the subsequent history of quoiting in central Scotland must rely entirely on the evidence contained in local newspapers. Inevitably, the coverage of the sport these provide is far from complete, the degree of incompleteness almost certainly increasing as quoiting declined in popularity to become of less interest to readers. Despite the flawed nature of the source, however, there is sufficient homogeneity in the newspaper evidence to permit at least a crude indication of what happened to the game during the first half of the twentieth century.

As Table 1 shows, the interest in club quoiting had already begun to decline in the course of the first decade of the century, the number of clubs known to have been extant falling from 27 between 1901 and 1905 to seventeen between 1906 and 1914. Symptomatic of the decline was the situation at Bannockburn where, it was reported in 1912, "there is no club at the moment." '6' Compared with what was to follow, however, the state of club quoiting in the decade or so prior to World War 1 was reasonably healthy. Apart from the resuscitation of a club at Bannockburn in 1914, new clubs were formed at Deanston in 1901, Cowie in 1902, Braco in 1908, Stirling (the Catholic Young Men's Society Quoits Club) and Fallin in 1910, Blairhoyle (Port of Menteith) in 1911 and Falkirk in 1912. Club quoiting was never again to be so popular. Between the outbreak of World War 1 and the mid 1920s it disappeared almost completely, revived only modestly in the late 1920s and early 1930s and again collapsed between 1933 and 1937. A further revival of interest in club quoiting seems to have occurred towards the end of the 1930s but was abruptly halted by World War 11. From 1945 until it too ceased in the mid 1960s the only quoits club to remain active in central Scotland was that operating under the aegis of the Fallin Miners' Welfare. Significantly, all its recorded post-war inter-club fixtures involved clubs from outside the region.

Accompanying the decline in the number of local quoits clubs was a marked shift in their geographical distribution (Maps 1-3). By the inter-war period, except at Croy and KUsyth, club quoiting had entirely disappeared from districts to the north and west of Stirling. Such clubs as remained were concentrated in areas to the south and east of the town, chiefly in the parishes of St.Ninians and Denny and the town of Bo'ness.

The Stirling & District Quoiting Association (SDQA) follows a similar history of decline. Initially it was reasonably successful, its Challenge Cup for affiliated clubs attracting ten entries in 1901, nine in 1902 and nine in 1904. By 1910, however, a decision taken at the AGM to extend the area for club membership from a fifteen to a thirty mile radius of the town in order to increase the number of entries for the Cup suggests that the Association was in trouble. The attempt to stimulate interest failed and by 1911 the SDQA was defunct. After two abortive attempts to revive it, in 1914 and 1920, the SDQA re-emerged in 1927, the number of clubs affiliated to it rising from four in 1929 to six in 1932. In 1933 it once more collapsed and did not re-appear until 1939, this time with eight member clubs and a single-handed county championship competition sufficiently popular to attract 32 entrants.'7' The Association struggled on through 1940 and 1941 before disappearing forever.

Newspaper comment on the general health of the sport broadly confirms the evolution suggested by variations in club numbers and the fortunes of the SDQA. Early in the century quoiting prospered. In 1901, for example, both the finances and membership of the Stirling Quoits Club were described as "highly satisfactory" and "great interest and a large attendance of spectators" was reported for a semi-final of the SDQA between the Stirling and Fishcross dubs.(8) Every effort will be made to make the coming season as successful

as the previous," the Buchlyvie club announced in April 1902.<<sup>9</sup> By July the club was in "a very healthy state" with "membership greater than in any previous year" and a fourth rink having to be constructed to cope with demand.<sup>10</sup> The 1903 season was less successful. In April it was reported that "the number of members playing the game is not as numerous as formerly": in May that the entry for the club's Matheson Cup competition was "not as large as in former years": and in July that "for some time back the game of quoits has been very dull in the village."<sup>11</sup> Even so, the club's membership roll remained "up to average."<sup>12</sup> Early in 1902 the Arnprior Quoits Club claimed a doubling of membership and "a good turnout with spades, barrows, spirit levels" to prepare the ground for the coming season. In June 1903 its pitches were "fully occupied every night." <sup>13</sup> "The pastime which monopolizes interest at Bannockburn...is quoiting", it was reported in April 1903.<sup>14</sup> At Gartmore, too, the local club was "flourishing in membership and finances" and "much interest" was "being taken in the game".<sup>15</sup>

In some parts of the region quoiting retained its appeal throughout the second half of the decade prior to World War 1. Inter-and intra-club competitions at places as diverse in character as Arnprior, Bannockburn, Carron, Fishcross, Gartmore and Stirling continued to attract large numbers of entrants and spectators. At Buchlyvie in 1904 quoiting remained "a popular game for summer evenings."<sup>16</sup> "The good old game is being revived in the district", Sir James B. Smith noted in 1908 after watching an exhibition match between Shennan of Stirling and Bone, the Scottish champion, to celebrate the resuscitation of the Stirling Quoits Club which had become defunct in 1906.<sup>17</sup> 1908 was "a very successful year" for the Gartmore club, with an "increasing" membership and a future "promising success".<sup>18</sup> In October 1910 "quoiting fever" was reported among the miners of Stirlingshire.<sup>19</sup> At Falkirk in 1912 quoiting was "the latest amusement to catch on".<sup>20</sup> At Braco in August of the same year it was practised "nearly every night."<sup>21</sup> At Bannockburn local quoiters returned "into prominence" in 1912 and the sport was booming in 1913.<sup>22</sup>

Elsewhere, however, the evidence of newspaper comment confirms that the popularity of quoiting was already in decline. As early as 1902 Mr Ferguson of the Gartmore club expressed concern about the lack of interest in the game among younger people. Two years later the club was sufficiently anxious about the future to initiate a handicap competition solely for younger players in an attempt to increase their interest. At Tillicoultry the situation was even more serious. "There was a day when Tilly could hold its own in the noble and ancient game of quoiting. But apparently this has passed away," it was noted in 1902.<sup>23</sup> By 1904 the Tillicoultry Westerton club was defunct and there was "not even a quoiting tournament to relieve the ordinary humdrum existence."<sup>24</sup> "Membership has not been so large this year", the Buchlyvie Quoits Club reported in 1905.<sup>25</sup> "Quoiting in these latter days has to some extent deteriorated. In the country districts where it once flourished, it is now hardly ever played, and if in the towns a few enthusiasts still engage in the game, there is not the same rivalry between parishes and villages that there once was", it was

claimed the following year.<sup>26</sup> "For some years quoiting has been at a discount in Stirling which used to have a good club", it was noted in 1910.<sup>(27)</sup> Even at Bannockburn the popularity of quoiting temporarily slumped. "What has *become* of these warriors now? Is the local club wound up?," the *Stirling Observer* inquired when not a single competitor from the village entered any of the several open tournaments held in the Longcroft district in 1911.<sup>(28)</sup>

A close association between trends in club numbers, on the one hand, and the nature of other newspaper references to quoiting, on the other, continues in *subsequent* decades. "Bowling seems to be about the only sport that can live in wartime", the *Stirling Observer* commented in 1915, seemingly confirming the collapse of quoiting during World War I.<sup>(29)</sup> No mention is made to quoiting in press reviews of the sports practised at Deanston and Doune in 1921 and Tillicoultry in 1922 and 1923 @>, nor does it appear in a wide range of *sports* claimed by the *Stirling Observer* in 1925 to have "increased in popularity to a remarkable degree in Stirling and the surrounding district in recent years".<sup>\*31</sup>

*Confirmation* of a modest, if temporary, revival indicated by the growth of club numbers in the late 1920s and early 1930s is provided by other newspaper evidence. The revival began at Plean during the coal strike of 1926 when "all sorts of outdoor recreation is indulged in by men, the chief of which is quoiting."<sup>(32)</sup> The second leg of the SDQA Cup Final between Plean and Fishcross at Plean in September 1927 attracted a crowd of almost 200 and record gate receipts of £4-13s: at Bannockburn in May 1928 a match between Bannockburn and Fishcross in the newly formed Stirlingshire League "a large audience *including* a goodly number of the fair sex."<sup>33</sup> At the second leg of the SDQA Cup Final between Bannockburn and Kilsyth at Bannockburn in August 1929 "had the gallery who watched the match free from the surrounding high ground paid for admission, the club's enclosure would have been taxed to the utmost."<sup>34</sup> For the Bannockburn club's chief competition of 1930 there was a "large entry" of 58 members and all the games were watched by substantial crowds. "Obviously the game is reviving locally", it was concluded.<sup>35</sup> Interest in the club continued into 1931 with members showing "much enthusiasm" and satisfactory attendances at matches between Bannockburn and Denny in April and Bannockburn and Bo'ness Central in May.<sup>36</sup>

But even in *Bannockburn* the renewed enthusiasm for quoiting soon collapsed. By 1932 the game had "fallen into decline...the enclosure, which was erected with considerable labour, is now removed and the enclosed area in the Haugh is again laid open."<sup>37</sup> What happened at Bannockburn was repeated elsewhere. Commenting in 1935 on the growing popularity "in recent years of the summer sports of tennis, bowls and, to a lesser extent, cricket," the *Alloa Advertiser* significantly made no reference to quoiting.<sup>38</sup> The fact that three years later the newly formed Fallin Miners' Welfare Quoits Club was reported to be "making great efforts to put Stirlingshire back on the quoiting map" further attests to the near total collapse of the

game in the mid-1930s.<sup>39'</sup> Outside Fallin, where it remained popular until the mid-1960s, in the long-term the effort clearly failed. Neither quoiting nor pitching (see below p 106-9) appear in a long list of sports referred to by James Allison in a talk on the value of sport given to the Stirling Rotary Club in 1947, nor among the various summer sports available to watch or play mentioned by Donald Cameron in his regular sports column in the *Stirling Journal* in 1952.

The history of quoiting competitions at Highland Games and other athletics sports gatherings follows a pattern very similar to that of the number of quoits clubs.<sup>40'</sup> Most frequent at Highland Games gatherings during the early years of the century (at Gartmore and Aberfoyle 1901-3, Kippen 1901-5, Airth 1902 and 1905, Alva 1902-14, Alloa 1903-7, Auchterarder 1903-5, Denny 1905 and Clackmannan 1905-6), their frequency declined in the years immediately prior to World War 1. Quoiting tournaments were abandoned at Gartmore & Aberfoyle and Kippen in 1906, at Clackmannan in 1907 and at Airth from at least as early as 1908. At the Alloa Scottish Games of 1908 they were replaced by a pitching competition, "a bit of an experiment on the part of the committee but its wisdom ... proved by the fact that there were seventy entries".<sup>41'</sup> Quoiting handicaps were held at the Sauchie Games of 1907, 1908 and 1911 but in 1910 and from 1912 to 1914 were replaced by pitching. The introduction of a quoiting competition at the Cowie Games of 1913 "was expected to be a big attraction but, strangely, the number of competitors was relatively small", while at the Alva Games of 1910 and 1914 quoiting was included in the programme only "after some discussion".<sup>42'</sup>

Except for those at Alva, Tillicoultry and Port of Menteith in the early 1920s, quoiting events at Highland Games gatherings in the years immediately following World War 1 were rare, disappearing at both Alva and Tillicoultry in 1923 and not included in the programme of events at other gatherings on which we have information - Bannockburn, Callander, Clackmannan, Gartmore & Aberfoyle, Kippen and St. Ninians. As with the number of quoits clubs, their frequency increased in the late 1920s and early 1930s. Quoiting handicaps were re-introduced at Tillicoultry in 1926 and Alva in 1928 and are known to have occurred at Highland Games meetings at Airth (1926, 1930 and 1934), Alloa (1930 and scheduled for 1931 when the Games were washed out), Blackford (1926-7, 1930), Auchterarder (1931), Bannockburn (1927-31 and 1934-6), Sauchie (1930 and 1931, the latter prevented by rain), Denny & Dunipace (1931-2) and Gartmore & Aberfoyle (1931-2). Thereafter, however, they largely ceased. Quoiting handicaps were last held at the Tillicoultry Games in 1933 and at the Alva Games in 1936 and, at least for years when lists of events are available, none were recorded at the Alloa Games (1935, 1939), Sauchie Games (1935, 1939, 1955), the Airth Games (1936, 1938-39, or the Kippem Games (1937). Only at the Airth Games of 1947 and 1953 did they make a subsequent, fleeting re-appearance.

Quoiting handicaps were also sometimes featured at other types of athletics meetings: at the Buchlyvie Coronation Celebrations of 1902, the Port of Menteith Coronation Sports of 1911 and the Fallin Peace Pageant and Sports of 1919: at annual sports events such as those organised at Coalsnaughton in 1904, at Alloa in 1906 (the annual gala of the miners of Clackmannanshire and Fifeshire) and by the Doune Order of Ancient Shepherds Society in 1906 and the Strathblane Reading and Recreation Club in 1910: or as fund-raising activities by institutions like the Kings Park Football Club and the Plean Colliery Silver Band in 1902, the Stenhousemuir Football Club in 1906 and the Bannockburn United Football Club in 1925. From time to time, too, they were hosted by quoits clubs themselves: at Plean in 1906, Longcroft in 1912 and 1913, Port of Menteith in 1913, Bannockburn in 1918, Coalsnaughton in 1920, Fallin in 1928 and Bo'ness in 1931. Of these, only the annual handicap organised by the Fallin club survived into subsequent years.<sup>43</sup>

During the early decades of the century head to head stake-money matches between leading quoiters were particularly popular in industrial and mining communities to the south and east of Stirling. The amount of stake-money involved varied from as little as ten shillings or £1 to as much as £50 a side, though was usually £5, £10 or £20. In almost all such contests quoits were thrown over the customary eighteen yards distance and matches decided by the first player to reach 61 shots, a practice which sometimes meant that they took as much as five or six hours to complete. The frequency of stake-money matches followed a similar evolution to that of other forms of quoiting activity: notably greater before World War 1 than after it and, except for limited resurgences in the late 1920s, early 1930s and late 1930s, negligible for much of the inter-war period and almost entirely disappearing after World War 1. (Table 2) Most of the large crowds these contests attracted also pre-date the First World War. The largest recorded attendance at a stake-money quoits match in central Scotland after 1900 was one of over 1,200 for a £20 a side, Stirlingshire championship game between William Marshall of Skinflats and Andrew Smart of Bannockburn at Bannockburn in August 1913.<sup>44</sup> Crowds of this magnitude, however, were unusual. More typical were attendances of "nearly 300" at Milngavie in 1902 for a contest between G.Chapman of Mavis Valley and William Liddell of Temple, and "about 200", described as "large", at Stirling in 1908 for an exhibition game between Bone of Glenbuck and Shennan of Stirling.<sup>45</sup> Attendances of even this size became less and less common after World War 1 as the sport lost its popular appeal.

In some respects the demise of quoiting is surprising. By the close of the nineteenth century a culture of organised sport was firmly established among the labouring populations of Scotland and the predominantly working class game of quoits was probably more popular than it had ever been. A further increase in working class leisure time and, despite high rates of unemployment in the inter-war period, rising average real incomes in the twentieth century might have been expected to reinforce, perhaps even enhance, its popularity. Why, then, did the game fall from favour?

There is nothing to suggest that this had anything to do with public opposition to the general conduct of its players and spectators, to the sport's inability to generate interest and excitement or to the costs of playing and watching. Incidents of competitor dispute and spectator misbehaviour did occur<sup>46</sup> but they were very rare. As was the case at the Fallin annual quoiting handicap in 1961 which was enjoyed by "a large well-behaved crowd", matches were invariably played and watched in good spirit.<sup>47</sup> Compared with its principal and ultimately more successful rival, bowls, quoiting aroused considerable passion among its supporters, much of it no doubt stemming from the often substantial amount of gambling involved.<sup>48</sup>

Quoiting was also a relatively inexpensive game to watch and play. Most inter-club matches could be watched free of charge and on the rare occasions when admission charges were levied they were never more than 6d, good value for the duration of the entertainment provided. Admission charges for spectators at stake-money quoits matches were probably similar to the 3d (for adults) and 1d (for children) asked of spectators at a pitching tournament at Coalsnaughton in 1909, at which competitors were charged a 6d entry fee to compete for four cash prizes of £1, ten shillings, 7s-6d and 2s-6d. In 1902 the annual subscription of the Tillicoultry Westerton Quoits Club was described as "modest" and that of the Gartmore club as being "within reach of all".<sup>49</sup> In the case of the Bannockburn club it was reduced from three shillings to two shillings in 1930 and 1s-6d in 1931 and 1932, well below the rates charged by bowling clubs.<sup>50</sup> Despite the low level of membership fees, quoiting clubs were rarely troubled by financial constraints. With relatively modest spending required for equipment and playing facilities, income exceeded expenditure on every occasion for which we have information - the Stirling club (1902), the Buchlyvie club (1902 and 1903), the Bannockburn club (1903 and 1931) and the Gartmore club (1903-4, 1906-8), with favourable balances ranging from as little as 6s-3d in the case of the Milngavie Craigton Quoits Club in 1901 to a substantial £230-4s for the Fallin club in 1945.

Conceivably, the long-term development of quoiting might have been different had it been a more suitable game for women and a wider age spectrum of males. Although regular attenders at quoits club social functions and sometimes represented among the donors of prizes for quoiting competitions, women rarely figured as spectators and never as players. Essentially, quoits was a game for mature, young adult males in their twenties and thirties. There were, of course, exceptions. Andrew Hunter, one of a long line of champions from the Hillfoots parish of Alva, played his first competitive match before the age of thirteen. William Dewar of Cowie was also playing stake-money matches in his teens. D. McIntosh and F. Ferguson, opponents in a £1 a side game at Tillicoultry in 1902, were both over sixty. James Walkinshaw, a former Scottish champion, was still competing at the age of 72. But players of such advanced years were unusual. At the age of 52 John Kirkwood was considered a "veteran".<sup>51</sup> Thomas Kerr played his last recorded game at the age of 46, John Shaw at 38 and James Shennan at 37. Basil Shennan had been retired

from quoiting for four years when, in 1917 at the age of 56, he took part in a tournament at Dennistoun in aid of limbless ex-servicemen. Ten years later, "after an interval of thirteen years", he competed at the Bannockburn Highland Games only to be forced to retire after winning his first round match. "Quoiting is a strenuous game and Shennan did not persevere. The quieter game of bowls makes more appeal to him today", the *Stirling Sentinel* commented.<sup>52</sup>) His brother James and John Shaw were others who found bowls a more suitable pastime for men of maturer years.

If they could do little to prevent the loss of older players to the physically less demanding game of bowls, quoits clubs were well aware of the need to attract the interest of the young, and at least one club, Gartmore, made positive efforts to try to do so.<sup>53</sup> On the whole such efforts proved unsuccessful. Quoiting failed to establish itself among children and teenagers who, therefore, reached early manhood already committed to games like cricket and soccer. For sports such as bowling, which also lacked a following among the young, this mattered less than for quoiting whose active participants were more often drawn from the same younger adult age-groups that supplied the majority of cricketers and soccer players.

That the considerable physical demands of quoiting were a hindrance to the long-term development of the sport cannot be denied. To ask boys and adolescent or elderly males to throw quoits over distances of eighteen or 21 yards for several hours at a time was to impose demands far in excess of what most of them were physically capable. The problem was compounded by the fact that there was a clear advantage in throwing the heaviest possible quoit in order to combat the effects of wind or to dislodge an opponent's lighter quoit. In the first leg of the SDQA Cup Final between Stirling and Denny in 1901, for example, it was reported that "the weather was very unsuitable and conditions all in favour of Denny who threw much the heavier quoit"/<sup>54</sup>) When Mitchell of Fishcross met Hamilton of Carron at Stirling in 1905, "Hamilton, who played much the heavier metal, easily won." (<sup>55</sup>> In 1910 the SDQA succeeded in banning the use of all grooved quoits weighing over 14 lbs. But this did little to remove the advantage to be gained from throwing the heaviest quoit possible and, as a result, quoiting remained a sport chiefly for males in their physical prime.<sup>56</sup>)

The problem caused by the physical demands of quoiting was compounded by the emergence of the similar but physically less strenuous game of pitching. In pitching the weight of the individual quoit was standardised at 1.5lbs and the distance from thrower to pin restricted to seven yards. Pitching is first referred to locally in 1901 when an open handicap tournament was held under the auspices of the East Pleun United Football Club. By 1903 there were pitching clubs at Bannockburn and Gairdoch. The region's first recorded head to head, stake-money pitching matches occurred a year later (see below). At this stage the game was still enough of a novelty for the *Stirling Observer*, "for the benefit of the uninitiated", to describe how it was played. "The game of pitching, or pitchers, a form of



small quoit, bids fair to take a place as a permanent addition to the pastimes of Stirling", the *Observer* noted in 1905.<sup>(57)</sup>

At first sight the sports of quoiting and pitching appear to have been closely associated. Head to head stake-money matches between leading pitchers were usually played on quoit club grounds and at least one quoit club, Longcroft (in 1905), is known to have organised a pitching tournament. In 1903 and 1904 inter-club pitching matches were run under the auspices of the SDQA and by 1905-6 pitching had become such an established part of its activities that the SDQA had changed its title to the Stirling & District Quoiting and Pitching Association. What happened after the First World War is unclear. On the one hand, a game between the Bannockburn and Glenyard clubs under the auspices of a Stirlingshire Pitching Association in 1929 suggests that the two sports were now controlled by separate associations. On the other hand, the existence of combined quoiting and pitching clubs at Bannockburn in 1939 and Cowie in 1944 implies that they remained closely linked.

Did quoiters see their support for pitching as a device for enhancing the popularity of their own sport? The fact that members of the Cowie Pitching and Quoiting Club in 1944 "anticipated introducing the big quoits" might suggest that this was the case. If so, the hope was to be disappointed. Despite the maintenance of a close, amicable relationship between the two sports, it is quite clear that pitching soon came to be regarded as a different activity which drew men away from quoiting rather than attracting them towards it. Thus, quoiting and pitching were considered sufficiently different in their appeal to players and spectators that both sometimes appeared on the same programme of events at Highland Games and other athletics sports meetings. Comparison of the names of quoiters and pitchers given in local newspapers confirms the fact that, in the main, the two sports were treated as alternatives rather than as easily inter-changeable variants of the same activity. Of 936 individual quoiters and pitchers named in the press, 726 (77.6 per cent) indulged solely in quoiting, 175 (18.7 per cent) solely in pitching and only 35 (3.7 per cent) had participated in both. Even among the two or three in every hundred quoiters and pitchers who tried their hand at both sports very few kept the two pastimes going at the same time: usually they moved permanently from one sport to the other. And when this did occur the typical progression was from quoiting to pitching rather than vice versa. In practice, it was rare for those who played the physically less robust game of pitching to graduate to the more strenuous game of quoiting. It follows that the growth of pitching probably acted to hinder rather than promote the subsequent development of its older 'heavy' rival.

It would be wrong, however, to see the rise of pitching as the major cause of quoiting's twentieth century decline. The fact is that both sports followed a remarkably similar pattern of evolution. Like quoiting, pitching was most popular in the years before World War 1, declining sharply in popularity thereafter. At its peak in 1904 the number of pitching clubs reached thirteen

- Bannockburn No.1, Bannockburn No.2, Carron No.1, Carron No.2, Camelon, Cowie, Dunipace, Gairdoch No.1, Gairdoch No.2, Laurieston, Longcroft, Plean and Sauchie. By 1910 there were just two active clubs, at Auchenbowie and West Plean, both of which shortly disappeared. Not until the mid 1920s, with the resuscitation of the defunct Cowie Quoit and Pitching Club in 1926 and proposals to inaugurate a Falkirk & District Pitching League in 1927, did club pitching re-emerge. The revival proved short-lived and from 1928 to 1937 references to club pitching in the local press are conspicuously absent. Signs of another surge of interest in the sport occur in 1938. "Memories of the days when Bannockburn was a pitching centre of more than local repute appear on the verge of a spirited revival", the Stirling Journal informed its readers.<sup>(58)</sup> Expectation became reality with the formation of a new Bannockburn Quoit & Pitching Club and the revival of a Falkirk & District Pitching League boasting a total of seven clubs (Bannockburn, Bannockburn Peterswell, Dennyloanhead Watson Place, Bonny bridge Caley, Denny, Falkirk and Whitecross). Within a year, however, the Bannockburn club was running only one team (the Peterswell) and the league comprised just four clubs (Peterswell, Bonnybridge Greenyards, Camelon and Denny). In the period during and after the Second World War club pitching was restricted to the villages of Cowie, where a club was re-established on the tennis courts at the Miners' Welfare in 1944 but failed to survive, and Bannockburn, where as late as 1953 it was claimed there was "a good pitching club...and many devotees" of "this old and skilfull game." <sup>(59)</sup>

As in the case of quaiting, pitching tournaments at Highland Games and other athletic sports gatherings were particularly prevalent in the years before World War 1, attracting substantial numbers of competitors and large crowds of spectators.<sup>(60)</sup> "The popularity of this pastime shows no sign of waning," the Falkirk Herald wrote of a pitching tournament at Longcroft in 1905.<sup>(61)</sup> As late as 1914 pitching was "still on the boom in the Bannockburn district."<sup>(62)</sup> During the First World War pitching handicaps, like quaiting handicaps, largely ceased. But again like quaiting, albeit in smaller numbers than in pre-war days, they re-appeared in the immediate post-war period: in 1919 at the Cowie sports, the Cowie Peace Celebration sports, the St.Ninians Highland Games, the Bannockburn sports and the Bannockburn Peace Celebration sports: in 1920 at the Cowie sports, the first annual games of the Plean Football Club and Silver Band, the Tillicoultry Devon Valley Football Club sports and at Highland Games gatherings at Alloa, Alva, Bannockburn, Clackmannan and Tullibody & Cambus: and in 1921 at the Bannockburn Highland Games and the Stirlingshire Highland Gathering in Stirling. Thereafter their frequency declined. The only references to pitching handicaps in the latter half of the 1920s and early 1930s are those organised in connection with the Alloa Games and the Bannockburn United Football Club in 1925, the St.Ninians Communal Kitchen Fund sports in 1926, the St.Ninians Highland Games of 1928 and 1929, the Tillicoultry Games and the Bannockburn Quaiting & Pitching Club (for members only) in 1930 and the Alloa Games in 1930 and 1931 (the latter washed out by rain). Apart from a

tournament at the Bannockburn Highland Games of 1934, throughout the rest of the 1930s they are wholly absent. Subsequently, except for those arranged by employees of the Denny Ironworks (in aid of the war effort) and the Bannockburn Quoiting & Pitching Club (for the Social Services Christmas Gifts Fund) in 1943, two tournaments at Cowie in 1945 and a proposed competition at the Airth Highland Games of 1947, pitching handicaps completely disappear.

The evolution of head to head, stake-money matches between the leading exponents of pitching also follows a similar course to those among quoiters.<sup>63</sup> From a total of thirty between 1904 and 1914, the number of stake-money pitching matches reported in the local press fell to thirteen between 1918 and 1924 (nine of them in 1919) and to just four thereafter, one in 1940 and three in 1944 (M)

The fact that the evolution of quoiting was closely paralleled by that of pitching indicates that the decline of the former owed little to competition from the latter. Quoiting's problems lay elsewhere. One of these was the increasingly narrow socio-occupational composition of its players and supporters. Always a predominantly working class game, down to the end of the nineteenth century it attracted followers from a relatively broad cross-section of the working class population. In 1880 the game was so popular in rural parishes that one observer actually suggested that it was "confined to agricultural workers." Twenty years later it remained popular in agricultural communities like Braco, Buchlwie, Gartmore, Kippen, Muthill and Thornhill. Even in the nineteenth century however, it drew most of its participants from men employed in mining and industrial occupations - from the textile workers of Alva, Auchterarder, Deanston, Kinbuck (Dunblane) and Menstrie, from employees in the bootmaking, brewing, distilling and glassmaking industries at places like Alloa, Blackford and Killearn, and above all, from the coalminers and ironworkers in districts to the south and east of Stirling. To judge from the geographic distribution of quoits clubs (Maps 1 and 2) and from the occupations of some of the game's leading supporters, quoiting maintained a reasonably broad occupational base during the earliest years of the twentieth century. Claude Buchanan, president of the Deanston club in 1901, was a blacksmith: John Shaw and the brothers Basil and James Shennan, of Stirling, shoemakers: James Duncan, president of the Stirling club in 1902, an aerated water manufacturer: John Morris, the club captain, a cooper: Robert Morgan, president of the SDQA in 1902: and James Keir "a keen quoiter...for many years" hoteliers: John McCallum, vice-president of the Gartmore club in 1903, a builder: and Alexander Livingstone, a member of the Arnprior Quoits Club in 1905 a butcher. As late as 1902 William Ferguson, chairing a prize presentation of the Gartmore club, still felt able to declare that quoiting was "one of the best games for rural areas".<sup>(66)</sup>

In the course of the decade or so prior to the outbreak of World War 1, however, the socio-occupational structure of the quoiting population altered dramatically, coming to focus more or less exclusively on men employed in manufacturing and, in particular, mining occupations. As early as 1904 the

forty participants in a tournament organised by the Stirling Kings Park Football Club were drawn "mostly from mining districts among whom the game is very popular."<sup>(67)</sup> Six years later the *Stirling Observer* reported "a quoiting fever...among Stirlingshire miners."<sup>(68)</sup> In 1918 a £20 a side match between William Marshall of Carronshore and Alexander Wighton of Bannockburn at Denny caused "much interest to miners in the district."<sup>(69)</sup> In 1926 it was local miners who were responsible for the revival of quoiting at East Plean. "Quoiting is very popular in Stirlingshire mining areas", the *Stirling Journal* announced in 1930.<sup>(70)</sup> Significantly, too, it was only at the Fallin Miners' Welfare that club quoiting survived in central Scotland in the years after World War 11. "Quoiting is a game which has lost much of its popularity but is still strong among the mining fraternity", it was noted in 1961.<sup>(71)</sup>

The consequences of this contraction in the socio-occupational source of quoiting's following would have been much less serious had those industries from which it continued to draw the bulk of its support remained prosperous. Sadly for the future of the sport they did not. The decades after World War 1 were difficult ones for many of the region's main staple industries. With the disappearance or decline of numerous local industries - cotton textiles at Balfron, calico printing and alum manufacturing at Campsie, cloth printing at Strathblane, distilling at Kilbagie and Kennetpans, woollen weaving at Auchterarder, wool, worsted and tweed manufacture at Kinbuck, the Springbank and Ashfield textile factories at Dunblane, the Deanston mills in Kilmadock and the iron industries of Falkirk and Carron - went many of the occupations which, traditionally, had provided a good proportion of quoiting's keenest players and spectators. But it was the decline of the coalmining industry, a decline more pronounced in central Scotland than in Britain as a whole, that was the most serious blow to the survival of the sport. Wherever pits closed - at Airth, Brightons, Campsie, Carronshore, Denny, Dunipace, Kilsyth, Muiravonside, Polmont, Redding, Saline, Shieldhill, Slamannan, Tillicoultry, Tullibody and Westquarter - quoiting soon ceased. Where coalmining remained a major employer of labour - at Cowie, Fallin, Millhall, Pirnhall and Plean in the parish of St.Ninians, at Twechar in the parish of Kirkintilloch, at Croy and Condorrat in Cumbernauld, at Sauchie, Tullibody and in parishes on the emergent Clackmannanshire and West Fifeshire coalfield (Carnock, Clackmannan, Culross and Tullialan) - it lasted longer.

Of course, the demise of quoiting cannot be wholly explained by the fading fortunes of the region's principal industrial and mining activities. Even in communities like the Fifeshire parishes of Auchterderran, Beath, Ballingry and Kinglassie, where coalmining remained prosperous and by far the greatest employer of labour, interest in the sport often completely collapsed. Part of the explanation, therefore, must also lie in the growing preference for alternative sporting pastimes. The most destructive of these was soccer. From the very beginning of the twentieth century soccer was already 'the game' of the working man, "the players are his Gods until their powers decline."<sup>(72)</sup> In the Fife parish of Auchterderran, in which was

situated the once famous quoiting town of Lochgelly, quoiting was ousted by soccer and, to a lesser extent, bowls, cycling, fishing, golf and tennis.<<sup>(73)</sup> At nearby Beath, by the early 1950s, soccer "the miners' favourite sport. The desire to kick a ball and take part in organised games is almost instinctive with the miners. For that reason, other sports do not figure prominently, quoiting being one of those to have disappeared."<sup>(74)</sup>

At Ballingry "football is the chief outdoor sport...no longer to be seen is the game of quoits, played by the old miners."<sup>(75)</sup> "The new football club may have something to do with the falling off on certain evenings" in the number of members attending practice, the Buchlyvie Quoits Club suggested in 1905 <sup>(76)</sup> "Other forms of sport seemed more attractive", it was argued in 1926 as an explanation for the delay in re-establishing a pitching and quoiting club at Cowie.<sup>(77)</sup> Coupled with the deleterious effects of the contraction of traditional mining and industrial activities on the size of its pool of potential participants, the availability for working class consumption of a wider range of sports than ever before was sufficient to bring about the collapse of a recreation which, in central Scotland as much as anywhere else in the country, had once been among the principal leisure pursuits of the population.

#### FOOTNOTES

1. *Devon Valley Tribune* 10 April 1900. *Stirling Journal* 22 July, 2 Sep.1830. The region covered by this study includes the whole of the counties of Stirlingshire and Clackmannanshire, fifteen parishes in southern Perthshire, and the parishes of Bo'ness and Carriden in the county of West Lothian, Carnock, Saline and Torryburn in Fifeshire and Cumbernauld and Kirkintilloch in Dumbartonshire.
2. *Stirling Observer* 8 June 1837.
3. *Ibid.*, 22 July 1836.
4. *Stirling Journal* 6 July 1897.
5. As practised in the later years of the nineteenth century, the game of quoits involved 'throwing a metal ring, or quoit, at an iron or steel pin driven into a circle of stiff clay eighteen or 21 yards from the thrower. Two points were awarded for each quoit which ringed the pin or one point for every quoit landing nearer to the pin than an opponent's At inter-club matches teams of four, six or eight members, split into two three or four rinks of two players a side, were the norm and each rink decided by the first pair to reach 21 points. Quoiting tournaments at Highland Games and other athletics gatherings were normally open to all-comers and run as handicaps, the better players conceding a pre-determined number of shots to the less skilful. Matches were played on a head to head knock-out basis, the winner being the first player to reach fifteen points. Stake-money matches, on the other hand, were typically decided by the first player to reach 61 shots, a practice which meant that they sometimes took as much as five or six hours to complete. According to the preference of the thrower the weight of a single quoit varied from a minimum of 6 lbs to 14 lbs or more Most of the game's leading exponents threw a 10-12 lb quoit. For further details of quoiting in central Scotland during the nineteenth century see N. L. Tranter, *Organised sport and the working classes of central Scotland, 1820-1900: the neglected sport of quoiting*, in R J Holt ed., *Sport and the working class in modern Britain*, Manchester University Press, 1990, 45-66.
6. *Stirling Observer* 30 Nov. 1912.
7. A single-handed county championship had first been introduced in 1931
8. *Stirling Observer* 16 Mar. 1901. *Stirling Journal* 12 July 1901.
9. *Stirling Observer* 26 April 1902.
10. *Ibid.*, 26 July 1902.

11. *Ibid.*, 18 July 1903. *Stirling Journal* 24 April, 22 May, 17 July 1903.
12. *Stirling Observer* 18 July 1903.
13. *Ibid.*, 10 May 1902, 20 June 1903.
14. *Stirling Journal* 17 May 1903.
15. *Stirling Observer* 27 June 1903, 10 Oct. 1903.
16. *Stirling Journal* 13 May 1904.
17. The match was watched by "a large attendance of about 200". *Ibid.*, 22 May 1908.
18. *Stirling Observer* 3 Oct. 1908.
19. *Ibid.*, 22 Oct. 1910.
20. *Ibid.*, 7 Sep. 1912.
21. *Stirling Journal* 22 Aug. 1912.
22. *Stirling Observer* 30 Nov. 1912, 25 Oct. 1913.
23. *Devon Valley Tribune* 9 Sep. 1902.
24. *Ibid.*, 9 Aug., 1904.
25. *Stirling Observer* 29 July 1905.
26. *Stirling Sentinel* 19 June 1906.
27. *Stirling Observer* 6 Aug. 1910.
28. *Ibid.*, 9 Sep. 1911.
29. *Ibid.*, 5 June 1915. Even the one club known to have remained active during the war years, Blairhoyle, had difficulty finding players with the loss of young male estate workers to the armed forces. *Stirling Journal* 6 Sep. 1917.
30. *Ibid.*, 12 May 1921. *Stirling Sentinel* 17 April 1923. In 1922 bowling, golf, football and tennis were "well provided for in Tillicoultry...the only other country sport that is lacking is a quoiting ground." *Ibid.*, 29 Aug. 1922.
31. *Stirling Observer* 25 June 1925.
32. *Ibid.*, 10 June 1926.
33. *Stirling Journal* 17 May 1928.
34. *Stirling Observer* 20 Aug. 1929.
35. *Stirling Journal* 18 Sep. 1930.
36. *Ibid.*, 16 April 1931.
37. *Ibid.*, 30 June 1932.
38. *Alloa Advertiser* 27 April 1935.
39. *Stirling Observer* 26 July 1938.
40. With only occasional exceptions, events of this kind were open to allcomers and run as handicaps, the better players conceding shots to the less skillful. Matches were played on a head to head knock-out basis, the winner being the first player to reach fifteen shots. No attempt was made to standardise the weight of the quoit used by each competitor, but the distance over which the quoit was thrown was usually eighteen yards. Despite the modest amount of prize-money offered - normally £1 to the winner, the competitions attracted all the game's leading exponents.
41. *Alloa Advertiser* 25 July 1908. At other Highland Games gatherings of the period, for which lists of events are extant (Kincardine in 1907 and Cowie, Culross, Strathendrick and Tullibody in 1908), quoiting had also disappeared.
42. *Stirling Observer* 5 July 1913. *Devon Valley Tribune* 17 May 1910, 14 April 1914.
43. Begun on a regular basis in 1938, the event was held every year until 1942 and from 1945 to 1961.
44. *Falkirk Herald* 30 Aug. 1913. The attendance at a game between Marshall and McMullan of Denny at Fishcross in 1903 which produced gate receipts of £16, "a record for a quoits match in the Hillfoots", was probably of a similar size. *Devon Valley Tribune* 30 June 1903.
45. *Stirling Observer* 20 Sep. 1902. *Stirling Journal* 22 May 1908.
46. In 1904 three miners were charged with causing a disturbance at a quoiting

- tournament in East Plean. *Stirling Observer* 19 Sep. 1904. In 1905 the SDQA was required to adjudicate on a match between Stirling and Fishcross which ended prematurely when Stirling refused to continue following a complaint from the Fishcross team that a Stirling quoit had been moved illegally. *Alloa Advertiser* 1 July 1905. In 1913 David Whyte, a baker, and Michael McCormack, a miner, were each fined ten shillings for fighting at a match at Bannockburn. *Stirling Journal* 2 Feb. 1913.
47. *Stirling Observer* 13 July 1961.
  48. "A good deal of money *changed hands*" on the result of a game between Logan and Dewar at Stirling in 1904. *Stirling Journal* 21 Oct. 1904. Of a match between Dewar and Lawrie for £20 a side at Denny in 1910 it was reported that "the stake-money is a small thing beside the amount of betting on these encounters." *Stirling Observer* 22 Oct. 1910.
  49. *Ibid.*, 3 May 1902. *Devon Valley Tribune* 9 Sep. 1902.
  50. The annual subscription of the Fallin Polmaise Bowling Club was six shillings from 1911, the date of the club's foundation, until the end of World War 11, when it was raised to ten shillings.
  51. *Devon Valley Tribune* 4 Aug. 1903.
  52. *Stirling Sentinel* 2 Aug. 1927.
  53. See above p.3
  54. *Stirling Observer* 17 Aug. 1901.
  55. *Falkirk Herald* 28 Oct. 1905.
  56. A quoit usually *weighed* between 61bs and 141bs. The most *common* weight was 10lbs - 12 lbs.
  57. *Stirling Observer* 21 May 1904, 29 April 1905.
  58. *Stirling Journal* 26 May 1938.
  59. *Ibid.*, 25 June 1953.
  60. For example at Highland Games gatherings at Cowie and *Clackmannan* in 1906, Alloa and Clackmannan in 1908, Alva, Coalsnaughton and Cowie in 1909, Alloa, Ban-nockburn, Cowie, Sauchie and Tullibody & Cambus in 1910, Alloa, Clackmannan, Kincardine and Sauchie in 1911, Alloa, Alva, Clackmannan, Kincardine, Menstrie & Blairlogie, Sauchie and Tullibody in 1912, Alloa, Alva, Kincardine, Menstrie & Blairlogie, Plean and Tullibody in 1913, and Bannockburn in 1914: and at athletic sports events organised by the East Plean United FC in 1901, Cowie Wanderers FC in 1903, St.Ninians Thistle FC, Sauchie FC, Cowie Wanderers FC and Stirling Kings Park FC in 1904, Polmont Redding Athletic FC, Longcroft Thistle FC and Cowie Wanderers FC in 1905, Sauchie & District Instrumental Band in 1908, the Bannockburn Benefit Fund Committee in 1909, Cumbernauld FC and Clackmannan FC in 1910, Coalsnaughton FC in 1912 and the Cowie Bowling Club in 1913 and 1914.
  61. *Falkirk Herald* 12 Aug. 1905.
  62. *Stirling Observer* 17 Jan. 1914.
  63. As in quoiting, pitching money matches were decided by the first player to reach 61 shots but, unlike quoiting, were rarely played on a handicap basis. The typical amount of stake-money involved rose from £5 or £10 a side before World War 1 to £20 or £50 a side in the post-war years.
  64. At the height of their popularity pitching money matches attracted substantial crowds: three hundred for games between William Cumming and Sam Meldrum at Bannockburn in 1904 and Robert Wighton and John Allan at Fallin in 1944: and almost a thousand at Denny in 1919 for a £50 a side contest between Peter Cramb of Cowie and James Howden of Grahamston, the Scottish champion. Throughout the period, pitching was almost entirely restricted to communities immediately to the south and east of the town of Stirling: the parishes of St.Ninians, Falkirk and Larbert, which were also the chief foci of quoiting. Of 47 local pitchers for whom place of residence is known, fifteen lived in the parish of

- St.Ninians and 22 in the Falkirk/Larbert district.
65. W Nimmo, *The history of Stirlingshire*, 2 vols., 1880, vol. 2, 363.
66. *Stirling Observer* 11 Oct. 1902.
67. *Ibid.*, 21 May 1904.
68. *Ibid.*, 22 Oct. 1910.
69. *Ibid.*, 25 May 1918.
70. *Stirling Journal* 8 May 1930.
71. R C Rennie ed., *The county of Stirling*, *The Third Statistical Account of Scotland*, Glasgow, 1966, 188.
72. J H Muir, *Glasgow in 1901*, Glasgow 1901, 192, 225.
73. A Smith ed., *The county of Fife*, *The Third Statistical Account of Scotland*, Edinburgh, 1952, 421, 429, 437.
74. *Ibid.*, 453.
75. *Ibid.*, 460-1.
76. *Stirling Journal* 24 April 1903.
77. *Ibid.*, 2 Dec. 1926.

Table 1. Number of quoits clubs 1901-1965.

1901	18	1913		1928	5
1902	21	1914	9	1933-6	
1903	18	1915-7	1	1937	2
1904	17	1918		1938	9
1905	13	1919	1	1939	8
1906	4	1920	2	1940-1	2
1907	3	1921	1	1942-3	
1908	6	1922		1944-7	1
1909	6	1923	1	1948-52	
1910	6	1924-5		1953-65	1
1911	3	1926	1		
1912	1	1927	4		

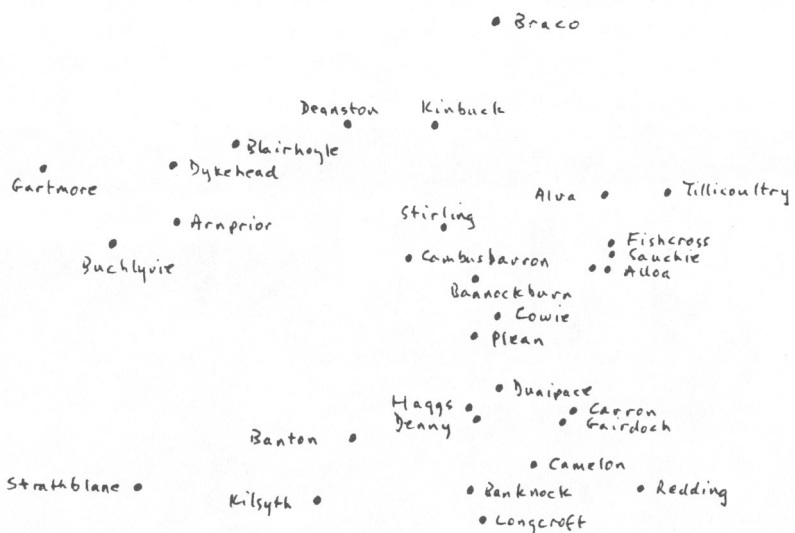
Table 2. Number of reported head to head stake-money quoiting matches,

		1901-65.			
1901	4			1928	2
1902	6	1913	8	1929	
1903	4	1914-6		1930	3
1904	13	1917	2	1931	5
1905	16	1918	7	1932-8	
1906	9	1919	7	1939	2
1907	5	1920-2		1940	4
1908	15	1923	2	1941-42	
1909	3	1924		1943	1
1910	1	1925	2	1944-54	
1911	1	1926	1	1955	1
1912	5	1927	5	1956-65	

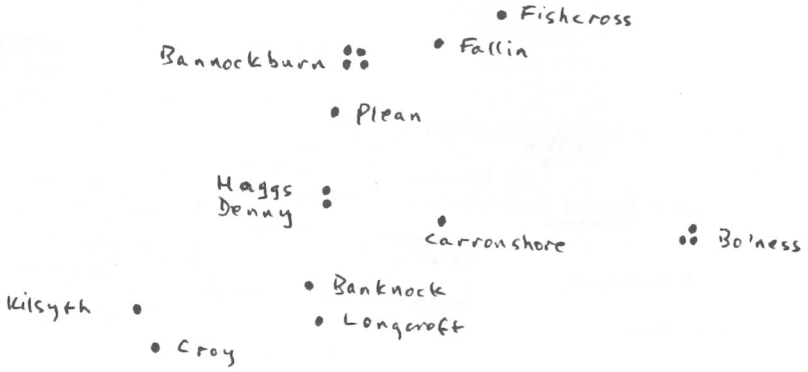




Map 1. Distribution of Quoit Clubs in Central Scotland, 1891-1900



Map 2. Distribution of Quoit Clubs in Central Scotland, 1901-14



Map 3. Distribution of Quoit Clubs in Central Scotland, 1927-39



Figure 1. The Alloa Ferry, Lord Erskine, built 1886

## ALLOA, THE PORT, SHIPS AND SHIPBUILDING

Jannette Archibald Alloa Museum

Some information used for the Alloa Harbour and Shipping Exhibition  
at Alloa Museum in May 1992

On his visit to Alloa in the mid-18th century Daniel Defoe, author of *Robinson Crusoe*, was much impressed by the picturesque and busy harbour on the upper reaches of the River Forth, saying-

"A merchant of Alloa may trade to all parts of the world."

Indeed by the 1750's over 100 brigantines and sloops had Alloa as their port of registration, exporting coal and salt from local pits to the Scandinavian and Low Countries. They returned with their holds filled with grain and sand for the Alloa Breweries and Glass Works. Alloa's main advantage over ports further down river was its inland position; the further cargoes could be transported by water the faster and cheaper it was; at this time roads were poor and often impassable.

The history of the port goes back further than written records. The earliest mentions were in 1502 when James IV provisioned a ship bound for Alloa Pow (creek), and in 1558 for coal transported from Alloa to Inch Keith. During the 18th century the Scots had privileges from the Dutch people which no other country received. At Campvere on the island of Walcheren, Scottish sailors were admitted to the port free of charge at 'The Scotch Gate.' The term 'Scot Free' originates from these privileges.

In 1710, John Erskine obtained permission for Alloa to become a Customs port. Alloa Pow, at the mouth of the Brothie Burn had earlier been only one of twelve creeks within the limits of the port of Borrowstounness. It so prospered now that in 1754 the dock revenue was so high the trustees were able to "rebuild the pier and execute new works." In 1815 Alloa became an independent port.

Table of Events in the Early History of Alloa as a Port

- 1502 King James IV paid for the provision of a ship bound for Alloa.
- 1558 Records of coal being carried from Alloa to Inch Keith.
- 1573 The Povv was used for the export of contraband and unfree goods.
- 1620 A charter grants the Earl of Mar the privileges of the Port and Pow of Alloa. (This does not imply the existence of a built harbour.)
- 1655 The reference to the 'herberie' was probably an artificial structure.
- 1685 The expression Port and Shore implies that vessels had at that time an improved foreshore.
- 1710 John Erskine Earl of Mar obtains Customs House for Alloa.
- 1713 Alloa constituted as a Port (member of the port of Bo'ness).
- 1755 Roy's map marks a pier NW of the Pow with a sluicing pond in the Pow a shorter distance higher up.
- 1756 Quay wall revised one foot above water mark. A quay fronting on

the river west of the Pow.

1757 Addition of a quay 265 feet long on the north bank.

1761 Another quay 118 feet long linking up the two already existing.

766 Construction of wagonways from the collieries.

1772 A commodious harbour existed.

1791 Widening of the Pow to 70 feet.

1815 Alloa constituted as an independent port.

1892 The Trustees of the Harbour sold out to North British Rail and then to North British Transport Company.

#### SMUGGLING

In the early 18th century, smuggling was regarded as an excusable offence and the law was not strictly applied. The English customs laws which were applied to Scotland after the 1707 Act of Union were not respected by Scottish people; though banned as imports the luxuries of life found their way to Alloa. Cargoes from Holland of wine, spirits, fruits, muslins, silks and velvet—being shipped to Scandinavia, were often partly unloaded at Alloa, Airth and Elphinstone (Dunmore) and the remainder carried on to Norway or Sweden. The upper classes if not directly involved in smuggling, were known to aid and abet the smugglers.

#### THE TOBACCO TRADE

Much of the mid-18th century prosperity was because Glasgow's rich tobacco merchants established large warehouses in the town. It was the nearest east coast port to the city and they made their profits from the re-export of their products to Holland. The Dutch could not buy tobacco direct from the British colonies in America because of the strict navigation laws. Pack-horses carried the bales of tobacco overland from the Clyde to Alloa. Some of it was held to manufacture into cigars and snuff by John and George Pearson at their Snuff and Tobacco Mill at Jellyholm Brae near Gartmorn Dam—its Alloa Pigtail was a popular tobacco. But most of the bales were loaded on to sailing ships in the harbour and carried to the Low Countries where the Dutch preferred to process it themselves. From 1783 however, the Dutch cigar makers could buy direct from American growers, the American Wars of Independence having set the colonies free. The Glasgow tobacco barons and Alloa consequently lost this lucrative part of their trade.

Alloa's old links with Glasgow received an even worse blow in 1790 when Scotland's first overland waterway—the 35 mile long Forth and Clyde Canal—provided the city with a direct link with the rapidly growing port of Grangemouth where the canal entered the Firth.

In 1838, 1250 ships were cleared from Alloa taking over 80,000 tons of coal. So despite the tobacco trade and canal setbacks. Alloa remained busy with coal exporting, cargoes for the local factories, and the steadily increasing import of pit props for the area's coal mines. In 1861 it was decided to build a large new dock basin, and when it was completed two years later, it was

450 feet long, 137 feet broad, 24 feet deep and had a fifty foot entry gate. At this time a dry dock for ship repairing was also constructed.

#### A DUTCH CONNECTION-HIGH SEAS PIRACY

Towards the end of the 19th century, Connad Klovborg a native of Thisted in Denmark, owned a thriving coal-merchant business in Alloa. He decided to establish his own shipping company to transport his coal from Alloa to Denmark, Holland and the Low Countries, and commissioned a Dutch company to construct sailing ships able to navigate the shallow waters of canals, since the established long high water routes around the coast of Denmark were more expensive and slower. His first vessel *The Stirling* was launched in 1897, but while anchored at Grangemouth in 1900 it was rammed by an English steamship. The *Skyjoid* sailed on 17 December 1901 with coal for Denmark, neither ship nor crew were ever seen again. The *Alloa* completed in 1898 disappeared on her second journey carrying coal from West Wemyss to Denmark. The *Alva* sailed from Sweden in 1902 carrying pit-props for Granton, but was found drifting off the coast of Denmark—master and crew all lost. An English steamer rammed the *Dollar* on its way from Norway to Dover in 1902. Klovborg's new schooner *Stirling* and the *Dunsmore* carried granite for the naval harbour in Gibraltar. In 1909, he sold the surviving ships, but continued his coal business in Alloa. The connection with Thisted was eventually broken after his death. His ships had all flown the Danish flag; it would appear that the competition for trade was so fierce and ruthless that it had led to the destruction of his fleet.

#### RIVER FRONT

During the last two decades of the 19th century and the beginning of the 20th, *the* river front was the busiest part of the town. The dock was filled with vessels and others were moored outside awaiting their turn to enter. Ships were sometimes moored three abreast at South Alloa, while others lay at Kincardine waiting to come upstream. In the 1850's the shore was a great attraction for young people. It was the custom to go to the Shore "to see the boats gaun away." The sailing ships generally made two voyages in the year and lay up all winter. In early spring they would start off again.

In the Alloa area all kinds of industry flourished—sawmills; carpenters; rope works; blacksmiths; coal mining; glass making; brick works; engineering; and the gas works.

#### FERRIES

The Ferry Pier and adjacent properties on both sides of the river, changed ownership in 1885 with the Caledonian Railway Company's completion of the Alloa Railway Bridge. Alexander McLeod became the lessee of the ferry and piers. His *Lord Erskine* ferry (Figure 1) was built in 1886. It was replaced in 1905 by *The Hope*, a twin screw shallow draft steamer. The ferry was

worked from Alloa to South Alloa until the Kincardine Bridge was opened in 1936.

#### STEAMERS

The river steamers, some owned and managed from Alloa were the principal means of transport for passengers before the railway, especially to Edinburgh. There were regular sailing to Stirling, Bo'ness, Granton, Leith, and Broughty Ferry. The early *Prince of Wales* and the *Prince Albert* were replaced by the *Victoria*. Mr Galloway of Leith owned the paddle-steamers, *Edinburgh Castle*, *Stirling Castle*, *Lord Morton* and *Lord Aberdour*. Usually about once a fortnight there were pleasure sailings from Stirling to Leith. Two paddle-steamers, *Edinburgh Castle* and *Stirling Castle* were fitted with telescopic funnels and folding masts in order to pass under the Alloa Railway Bridge. The sail up and down the windings was perhaps the finest stage of the journey, with the Ochil Hills and Ben Lomond to the north, to the south the Denny Hills.

#### ALLOA RAILWAY BRIDGE

This swing rail bridge across the Forth was completed in 1885. Navigating it could be hazardous. In 1904, a small schooner being towed to Stirling collided with a span support on the north side. A similar accident occurred in 1927 when an old destroyer which had been lying in the mud near South Alloa waiting to be broken up, floated on a strong tide and drifted against the bridge at the same place. The bridge was partially dismantled when the Alloa Railway Station closed in 1968.

#### SHIPBUILDING

The 1825 map of Alloa shows ship building business owned by Alex Duncanson. In 1845 he launched the 500 ton *Lady Bruce*. By 1855 the firm had passed to his nephew John Duncanson who launched the *George Kidd* in the same year. The firm was then taken over in 1862 by Thomas Adamson who produced seven ships before 1872, the last of which was *The Alloa*. After his retiral Roy & Mitchell bought the shipyard, but produced only two ships during the 1870's. A new firm Thomson's made barges, but it was not until 1889 when the Grangemouth dockyard took over the Kelliebank Yard that the next ship was built in Alloa.

#### Kelliebank Shipyard

Thomson's began by building three steamers; *The Empress*, *The Moray* and *The Godolphin*. Then came the four masted barges, *The Lord Rippon*, and *The North Star*, followed by the three masted barges, *Bankholm* and *Bannockburn*. Finished barges were brought to the harbour to be completed with masts. Top gallant masts were lowered at the cross trees to allow passage under the Forth Railway Bridge.

Thomson's went into liquidation in the 1890's and was succeeded by McIntyre's who built three vessels, a small pleasure steamer for South America, a geared trawler and *Cambria*, a paddle steamer for the Southern Railway Company for the English Channel Service. McIntyre's also went into liquidation and was followed by Mackay Brothers who built steamers, both cargo and passenger, until 1913 when they too went out of business. The yard was then bought by Fletcher of Montrose, who only built two vessels.

#### Tank Landing Craft

During World War II, Arrols Engineering at the Kelliebank Yard and Forth Bank were commissioned to make Mark 4 and Mark 8 Tank Landing Craft (TLCs). The Forth Bank Yard was managed by the Motherwell Bridge and Engineering Co. Between these two yards 157 vessels were built at Alloa.

#### Jeffrey's Shipyard

Jeffrey's was established in 1876 as a blacksmith's in Fort Street near the 'wetdock.' There was a need for blacksmith work on the sailing ships arriving in South Alloa to unload pit-props, these ships came mostly from Baltic ports and were often lacking in the ironwork necessary for safety of the sails and masts-bands. The company moved into the site of the old wooden shipyard in 1890 and acquired the old stone dry dock in 1901. In 1907 the company was reconstructed and by 1911 started shipbuilding. Orders were obtained for dumb barges (no engines) for use on the Thames. Since the firm had never built ships before, they had to accept orders below cost, but they were then able to put 'Shipbuilders' on their letterheads and employ shipwrights (Figure 2). They became very successful in building steel ships and steam engines. By 1916 a London financial group owned 50% of the company and they were now able to build ships larger than 2,000 ton coasters.

#### Forth Shipbuilding and Engineering

In 1916, an independent entrepreneur, Sir Basil Zahoroff, known as the Mystery Man of Europe, bought Jeffrey's and constructed a new yard. This company, The Forth Ship Building and Engineering Company developed rapidly, and by 1918 had achieved a record number of vessels produced for the war, not only for Alloa but for the East of Scotland. During the early 1920's ships ranging between 4,000 and 8,000 tons were built. Two 13,000 ton vessels were the largest produced in the east of Scotland at that time. Many of the orders came from Norway. During the economic slump of the 1920's, all but one of the Norwegian companies who had orders with the Alloa firm had to be wound up.

Between 1911 and 1923, 30 steamships in the range of up to 3,500 tons were built.

## DECLINE OF THE PORT

There were other earlier causes which contributed to the decline of the port. In November 1914, the government stopped all traffic and commerce on the Forth because of the danger of information leaking to enemy countries. From that date the export and import trade on the Forth only partly recovered. It was also becoming possible to transport goods by motor vehicles to the larger ports. Owners of foreign vessels began to feel there was no point in navigating the upper reaches of the river when they could find better facilities at Grangemouth, so they eventually stopped coming to Alloa.

### MCLEOD'S SHIP REPAIRING AND BOILERMAKING

In 1910, on the death of the ferries owner and Mr McLeod the firm assumed the name McLeod and Sons. In 1925 they acquired the yard adjacent to and east of the ferry pier and carried on a very successful business of boiler-making, ship repairing and general engineering, including electric welding. Around 1935 the firm came under the management of William McLeod. The firm refitted and repaired many distinguished ships in the 1940's (Figure 3) including the cable ship *Dunavon* used in laying the PLUTO pipeline under the English Channel in 1944 to supply fuel to the Allied invasion forces in Europe. The *HMS Brittany*, a former channel ferry, probably the most beautiful ship to enter McLeods, was repaired after serving in the Far East and the Mediterranean. The Dance Class Anti-Submarine vessel, *HMS Saltarello* was refitted in 1942. Also fitted were the minelayer *HMS Redshank*, and *HMS Romney* which took part in the longest minesweep in naval history, were active in the recapture of Tobruk, and in the Sicily and the Anzio landings.

### COX LTD AND ALLOA SHIPBREAKERS

The battleship *Molke* which was scuttled at Scapa Flow after World War I was towed 280 miles to Rosyth upside down by Cox Ltd, she was then broken up by the Alloa Shipbreaking Co. Cox sold ten of the twenty-five destroyers raised at Scapa Flow to the Alloa Shipbreakers for £23,000, all broken up at Alloa. In July 1931 Cox sold his plant, good will, and salvage rights to the 28,000 ton battleship *Bryern* to the Alloa Shipbreakers, which itself was absorbed by the Metal Industries Group.

### KINCARDINE BRIDGE

The opening of Kincardine Bridge in 1936 improved road communication from Alloa to Grangemouth, and it became faster for ships to discharge at Grangemouth and have their cargoes carried by road to Alloa's factories. After 1945 attempts were made to modernise the port including the electrification of the Dock gates, but apart from specialist cargoes it could not compete with Grangemouth.

At the beginning of the 1960's the British Transport Commission officially closed Alloa to navigation.



### THE GLASGOW WHARF

Now, in 1992 Kerrs Chartering Ltd. of Glasgow, are seeking to re-open the old Glasgow Wharf at Alloa. Their specialised vessels can reach inland destinations without trans-shipping; shallow waters and low bridges can be negotiated giving a door-to-door service to customers means less damage and faster transit times. Not now to be sabotaged on the high seas by competitors as were Klovberg's around 1900 as mentioned on page 119 -The Danish Connection ... ; although the Forth Port's intent to charge £1,000 per landing (30 times that for Grangemouth) could be a 1990's sabotage. Over-crowded motorways and fuel costs are now highlighting again a port of Alloas original advantage-its position on the upper reaches of the River Forth. Another chapter in Alloas history of trade with Europe may yet be written.

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Figure 2. Alloa Shipwright's of Jeffrey's Yard, 1907

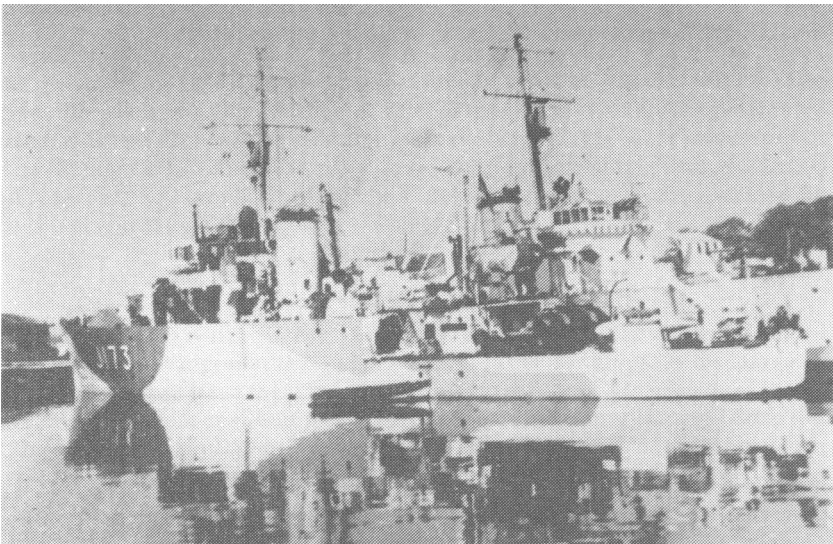


Figure 3. World War II ships being repaired at McLeod's ,Alloa





















