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This year's bulletin makes reference to observations from two climatological stations: Parkhead on Stirling University campus, and Carim in the Ochil Hills.

Stirling (Parkhead)

Grid Reference: NS 815969

Height above sea-level: 35 metres

The station is located in the University glasshouse area at the eastern end of the campus. Monthly returns of daily observations are submitted to the Meteorological Office in Edinburgh by Mr Liddell, of the University's Department of Biology. Observations include

- (i) Air temperature: Daily maximum
Daily minimum
Dry bulb
Wet bulb

- (ii) Soil temperature at 30 cm

- (iii) Total rainfall

and also wind speed and direction, visibility and state of ground.

Ochil Hills (Carim)

Grid Reference: NN 864049

Height above sea-level: 332 m

The Department of Environmental Science is currently developing research and teaching in upland environments and has established an experimental site in the Ochil Hills, in the upper catchment of the Burn of Ogilvie, near to the ruined Carim Lodge. During 1980 streamflow monitoring equipment and a climatological station have been installed. The latter was completed in January and began to produce reliable observations in April. Because of the remoteness of the site weather recording is automatic.

Air temperature is monitored using a bimetallic thermograph, and relative humidity using a hair hygograph. Both are located in a large thermometer screen and have their sensors about 1.2 m above the ground surface. Rainfall is recorded using a tipping-bucket raingauge which registers in increments of 0.5 mm. A run-of-wind anemometer provides a value of mean wind speed over a fixed time interval.

The Royal Meteorological Society have also loaned several small raingauges one of which has been installed as a ground-level gauge,

8 surrounded by a 1-m² anti-splash grid.

The site is visited on Mondays when charts are changed on the instruments. Checks are made against standards at the beginning and end of each week. Daily maximum and minimum air temperature and precipitation are extracted from the charts and summary tables prepared at the end of each month.

The Weather of 1980

1980 may well go down in the record books as the year of the false starts as far as the weather is concerned. A very mild spell in February promised us an early Spring and the dry warm weather of April and May raised hopes of a good summer but neither materialised. Summer, as in 1979, was dominated by cloud and rain, and warm sunny days were very rare in Scotland. At the end of the year we came close to having a White Christmas.

January. Cool but relatively dry.

Pressure remained high over Scotland during the New Year holiday and the weather was calm and clear. Air temperatures remained low and this was the coldest spell of the month. Milder weather followed on the 3rd with heavy rain and relatively strong westerly winds. The return of anticyclonic conditions on the 10th brought some mist and low overnight temperatures, but no air frosts. A cold front moving south on the 13th and 14th brought snow to many parts. Temperatures remained low, the daytime maximum at Parkhead reaching only 2.0°C on the 17th. More unsettled weather returned on the 19th as a cold front moved eastwards across Britain. On the 21st, an extremely vigorous depression brought gales and heavy rain. As the depression stagnated over Scotland and the strong winds subsided there was a brief mild interlude. A ridge of high pressure extending south-eastwards from Iceland on the 25th saw a return to calm cool weather until the 28th when unsettled Atlantic weather returned, with rain. By the end of the month winds had freshened from the north-east with the promise of snow.

February. Cold at first but becoming exceptionally mild.

The first few days brought strong north-easterly winds and heavy snow. Blizzard conditions were reported in many parts of Scotland. Daytime temperatures failed to rise above 2°C for 3 days. This was in sharp contrast to southern England where temperatures were well above the seasonal normal. The snow lingered over the weekend and was still lying on Monday 4th. Winds were fresh to strong westerlies. Mild and muggy conditions with winds mainly from a south-westerly quarter dominated the weather for the next two weeks. Air

temperatures were particularly high during the day reaching an unseasonal 11°C at Parkhead on the 14th. Night frosts were notably absent, temperatures falling to only 6.5°C on the 13th. This false Spring brought many trees and shrubs into early bud. Rainfall was recorded on most days during this period and was particularly persistent on the 9th and 12th. Pressure rose gradually after the 22nd and for much of the remainder of the month the weather became more settled. Cloudy skies limited nocturnal cooling and slight air frosts were recorded on only three evenings.

March. A cool wet month.

Temperatures fell gradually over the first few days as high pressure to the west of the country brought northerly air across Scotland. Night-time temperatures fell to -3.7°C on the 3rd. This cold period was replaced by one of unsettled Atlantic weather on the 4th bringing milder conditions to Scotland until the 13th. As a ridge of high pressure developed over northern Europe an easterly airstream was established. Daytime temperatures reached only 3.5°C on the 18th when winds were in excess of 27 mph. The easterly winds waned after the 20th but on the 21st a slow-moving front brought heavy snowfall to much of Scotland. Temperatures fell to below -4.0°C on four consecutive nights, from the 21st to the 24th. Low pressure dominated the weather picture for the remainder of the month. Daytime temperatures recovered sharply to reach 10°C on the 25th, and stayed there until the 31st apart from a short interlude with slightly cooler south-easterly winds on the 27th and 28th.

April. A warm and exceptionally dry month.

After an unsettled first day, pressure rose quite rapidly and by the 3rd an anticyclone lay over the British Isles. This brought sunny and relatively warm weather with cool nights for Holy Week culminating in an exceptionally mild and sunny Easter holiday weekend. Temperatures reached 16°C at Parkhead on Saturday 5th. The anticyclone drifted westwards into the Atlantic after the 7th bringing in air from a more northerly or north-westerly direction. Although daytime temperatures fell to 9.9°C by the 10th nights were milder. As the anticyclone moved back eastwards across southern Britain into Western Europe, a southerly airstream brought cloudy but extremely warm weather. Maximum temperatures on the 13th rose to 17.6°C at Parkhead and 17.7°C at the Ochil station. The temperature of 20°C recorded at Edinburgh Airport was the highest recorded in April since records began in 1949. The first rain in April, albeit only slight, occurred on the 14th as a weak warm front moved westwards across Scotland. As pressure fell over Europe an anticyclone developed to

- 10 the west of Britain and a cool northerly airstream became established. Weak frontal troughs moved south-eastwards on the 21st and 22nd as the weather pattern over the Atlantic was temporarily disrupted and brought a small amount of rain, but otherwise April continued to be dry.

May. Dry and sunny month.

The month began with high pressure to the north of Scotland and cool north-easterly winds from Scandinavia. Night-time temperatures eventually fell to -0.6°C and there followed 3 consecutive night frosts. Fortunately, this pattern began to break up on the 8th and high pressure became established over the North Sea on the 9th, moving to Scandinavia by the 11th. The imported warm Mediterranean air brought about a sharp increase in daytime temperatures under relatively clear skies. Maximum temperatures at Parkhead remained above 20°C from the 11th to the 19th. Night-time temperatures however, fell but remained a degree or two above freezing. A south-eastwards moving trough of low pressure approached Scotland on the 19th, crossing the country on the 20th. This brought very slight rain (0.5 mm) to both Parkhead and the Ochil station, and was accompanied by a drop in daytime temperature. With the restoration of high pressure to the north-west of Britain on the 21st, skies cleared and temperatures again rose to over 20°C on the 23rd and 24th, although there was a fresh northerly wind. High pressure moved away westwards on the 25th and for the remainder of the month the weather was dominated by unsettled cyclonic conditions. A slow-moving cold front brought the month's wettest day on the 27th, precipitation occurring as snow in parts of the Highlands.

June. Cool, wet and unsettled.

The month saw the beginning and the end as far as summer was concerned. During the first four days, pressure remained high to the south and south-east of Britain bringing mild south-westerly winds across Scotland. Rain fell from an eastwards moving warm front which crossed the country on the 2nd and 3rd. High pressure over the North Sea on the 4th brought a warm southerly airstream across Scotland and daytime temperatures rose to the month's highest value at Parkhead of 24.8°C , and 25.5°C at the Ochil station. Temperatures in the upper 20's were recorded in many parts of Scotland. Daytime temperatures decreased after the 5th as unsettled weather patterns developed bringing occasional thundery outbreaks of rain to much of Britain. As a depression moved northwards from France into Scotland on the 14th torrential rain fell as far north as the Borders. Stirling escaped the worst of the rain but nevertheless

received about 16 mm in 24 hours. A succession of frontal troughs ensured rainfall on all but three of the remaining days of the month. Westerly gales were experienced as a vigorous depression moved across northern Scotland between the 18th and 20th but rainfall was slight. Monthly rainfall was nearly 50 per cent higher than average at Parkhead.

July. Cool and wet.

A ridge of high pressure to the west of the country brought cool northerly air to Scotland on the 1st but by the 3rd this had given way to a more unsettled weather pattern which persisted until the 6th. A weak ridge of high pressure developed over the northern Atlantic along longitude 30°W on the 7th resulting in a cool relatively dry northerly airflow over Scotland. The ridge was breached on the 11th bringing a milder westerly interlude for four days, after which cooler air returned. Unsettled weather returned on the 17th bringing cloud and rain as frontal troughs moved across Scotland. Drier more settled weather on the 20th and 21st was associated with an area of high pressure which moved eastwards off the south coast of England. As this proceeded northwards into Germany and Scandinavia, Britain experienced the warmest weather of the month after the 23rd. Temperatures in England reached 29°C on the 25th. Scotland, however, saw little of the sun as Atlantic fronts moved across bringing cloud and rain. The heaviest rain of the month occurred on the 30th as a cold front moved northwards across the country. Temperatures reached the month's highest on the 28th at Parkhead (23.1°C) and Ochil (21°C) stations.

August. Damp but relatively mild.

With high pressure over central and western Europe, mild southerly air affected Scotland for the first three days. Heavy, sometimes thundery rain fell on the 2nd bringing 10 mm to Parkhead but only 6 mm to the Ochil station. As a ridge of high pressure developed to the west, Scotland experienced its coldest day of the month on the 7th although the north-easterly winds remained light. High pressure lingered until the 10th when less settled weather returned bringing rain and fresh south-westerly winds. Fronts crossing Scotland on the 13th and 14th brought some of the wettest weather of the month. Unsettled weather prevailed until the 21st when pressure began to increase to the west. Winds veered to northerly and became light and the next six days, for a change, remained quite dry. However, night-time temperatures fell quite sharply, falling to 2.6°C at Parkhead, and 1.0°C at Carim on the 22nd. Slight ground frosts were noted in some localities. As the anticyclone moved into the Continent and began to break up, frontal troughs accompanied by

- 12 fresh westerly winds brought rain on the 28th. Heavy rain fell on the 29th which was the wettest day of the month. 18 mm of rain was measured at Carim station. The month ended with the promise of more settled weather as a ridge of high pressure moved eastwards over Britain.

September. Mild and rainy.

Any hopes of a late summer were finally squashed as rain swept across Scotland on 22 of the 30 days of September. Temperatures remained relatively high for a while as high pressure persisted over northern France and southern England, but frontal troughs were accompanied by freshening winds and rain on the 4th. A vigorous depression and associated fronts gave Scotland strong westerly winds and rain on the 6th and 7th while most of southern England remained relatively dry until the 8th when a cold front affected these areas. On the 11th and 12th a deep depression which had merged with a decaying tropical storm moved across northern Scotland bringing strong winds and driving rain. 19.1 mm of rain fell at Parkhead on the 11th while at the Ochil station 27.5 mm was recorded. Yet more rain was to follow on the 13th as the next frontal systems in what seemed to be an endless queue dropped a further 11.6 mm of rain on the University. The weather remained unsettled and wet and on the 17th a deep Atlantic depression approached Britain which fortunately filled as it progressed eastwards. It nevertheless brought a further 9.5 mm of rain to the Ochil station. After a brief respite from the rain on the 19th and 20th, frontal systems brought slight rain after the 21st. The weather was particularly unsettled on the 26th as a warm front trailed eastwards across Scotland. Although only 5.9 mm of rain were recorded at Parkhead, 32.5 mm fell on the hill catchment, the highest daily total of the year. While southern England remained dry after the 24th, it was not until the 27th that somewhat drier weather came to Scotland. Despite a fresh westerly wind the clear skies of the 27th and 28th were a pleasant change. This brief interlude ended abruptly as further cloud and rain spread from the west on the 29th.

October. Cold, wet and windy.

Summer now seemed to be merging with the oncoming winter. To the wet weather, which had continued to be the main characteristic of the 1980 summer, were added the first air frosts of the winter. The first few days offered us stark contrasts in the weather. Strong westerly winds on the 1st gradually died away overnight and were replaced by calm clear anticyclonic weather on the 2nd. On the 3rd, warm and cold fronts crossed Scotland and heavy rain was recorded. Clear skies returned on the 4th but a fresh north-westerly wind kept

temperatures down. A vigorous depression crossed northern Scotland on the 5th and 6th. Strong westerly winds and intermittent rain persisted for the two days. As its eastwards movement slowed down as it approached Scandinavia, the depression remained the dominant influence on Scottish weather until the 9th, but no further rain fell. A deep depression which moved eastwards up the English Channel on the 10th and 11th resulted in heavy rain and low temperatures in southern and central England but for once the tables were turned. Scotland remained cool and dry. As winds veered to the north on the 11th, night-time temperatures fell sharply and the first air frost of the winter was recorded at Parkhead although this was only -0.5°C . Temperatures as low as -5°C were recorded in parts of Scotland. The south of England again experienced rain as another depression travelled up the English Channel after the 15th, deepening as it approached Denmark. Only a small amount of rain fell in central Scotland. Between the 18th and 20th Britain lay in the col between high pressure to north and south. Under relatively clear skies night-time temperatures fell to 0°C on three nights, reaching -3.6°C at Parkhead on the morning of the 20th (only 1.0°C at Carim). A warm front advanced northwards on the 20th bringing rain later in the day. The weather remained unsettled with occasionally heavy rain until the 28th when pressure began to rise. Heavy rain occurred over most of Scotland on the 22nd and 23rd some of which fell as snow on high ground.

November. Cool then mild. Generally wet.

High pressure over the Baltic and low pressure over Portugal dominated the weather over Britain for the first three days. Winds over Scotland were southerly, decreasing to light and variable by the 3rd. As the anticyclone moved westwards out into the Atlantic it passed to the north of Scotland bringing most of the country into a cool easterly airstream. Night-time temperatures however, fell below 0°C on only one occasion, on the 3rd. A weak cold front moved southwards on the 8th but brought no rain to the Stirling area. Another which affected Scotland on the 10th brought a small amount of rain. As High 'P' drifted south from the Iceland area into the Bay of Biscay, Britain was brought under the influence of westerly weather on the 13th. Winds became fresh westerly and rainfall was at times heavy. 10.5 mm fell on the University on the 13th, 17.5 mm on the Ochil station. One of the wettest days of the month was the 16th, when 11.9 mm and 23.5 mm respectively were recorded at the two stations. This unsettled but mild weather continued until the 25th by which time an extensive area of high pressure had built up over the Atlantic. Fronts moved

- 14 south-eastwards across the country on the 25th and 26th bringing rain to most parts. Temperatures fell as a northerly airstream became established on the 26th, the air originating over the Arctic Ocean. On the 28th, a fresh northerly wind combined with a maximum daytime temperature of only 4.5°C at Parkhead (0.2°C at Ochil station) to produce extremely chilling conditions. High 'D' which became stationary over the British Isles on the 29th had a centre pressure of 1046 mb, the highest recorded since December, 1962.

December. Cold, damp and windy.

A frontal trough moving south-eastwards across Scotland on the 1st brought slight amounts of rain to the Stirling area. As High 'D' became stationary over the Atlantic to the west of the country northerly weather affected Scotland until the 6th. A southwards moving cold front crossed the Stirling area early on the 5th but no rainfall was recorded. On the 6th and 7th High 'I' moved south-eastwards across Britain and was centred over France by the 8th. Nocturnal temperatures fell below freezing on the 6th and 7th while daytime temperatures reached only 4.4°C at Parkhead on the 7th in a fresh northerly wind. At Carim air temperatures stayed at or below freezing point for 72 hours! As the high moved into the Mediterranean, unsettled Atlantic weather patterns returned to Scotland. The weather remained unsettled for most of the remainder of the month. The month's wettest day occurred on the 14th as a deep depression moved rapidly across Scotland. A small ridge of high pressure moved across between the 18th and 19th and overnight temperatures fell to -2.5°C at Parkhead (-5.0°C at Ochil station). An occluded front brought overnight snow to Scotland which was still lying at 9 a.m. on the 20th. It lay for two more days before disappearing from lowland areas. Snow showers occurred on both the 25th and 26th but a white Christmas was not to be, except on high ground. Westerly gales, occasionally reaching storm force affected Scotland over the last three days of 1980 and the New Year was seen in to blizzard conditions.

Climatological averages for Parkhead

Climatological averages are usually taken over periods of 30 years in the case of temperature and 35 years in the case of rainfall. This is because, in Britain, there is a built-in year to year variation in all the parameters which we use to define climate. If we use too small a number of years our average may be biased by one extreme value. As there are only 10 years of records for Parkhead there is, therefore, considerable room for error in the calculation of averages. The table of climatological averages for this station should, therefore, be viewed with some caution.

	Mean °C Maximum	Diff. from Average	Highest Maximum	Lowest Maximum	Mean °C Minimum	Diff. from Average	Highest Minimum	Lowest Minimum	Mean °C	Number of Air Frosts	Mean Earth Temp. °C
January	4.6	- 1.2	8.0	1.0	- 0.8	- 1.2	4.0	- 6.5	1.9	14	1.1
February	7.0	+ 0.7	11.0	0.8	2.0	+ 1.2	6.5	- 5.0	4.5	8	3.0
March	7.3	- 1.3	11.0	2.9	0.3	- 1.3	5.5	- 4.6	3.8	12	3.7
April	13.4	+ 1.8	17.6	8.7	3.5	+ 0.3	7.9	0.5	8.4	0	7.7
May	17.1	+ 2.0	24.8	10.1	3.7	- 1.6	9.2	- 0.6	10.4	3	11.8
June	16.3	- 1.2	24.8	11.0	8.3	+ 0.4	15.0	5.2	12.3	0	14.5
July	18.3	- 1.4	23.1	14.3	9.1	- 1.5	15.2	4.0	13.7	0	15.3
August	18.4	- 0.4	21.1	14.6	10.2	+ 0.3	15.8	2.6	14.3	0	16.0
September	16.5	+ 0.5	19.4	13.1	9.1	+ 0.7	13.8	4.3	12.8	0	14.2
October	11.2	- 1.6	16.0	5.4	4.0	- 2.0	9.4	- 3.6	7.6	5	9.1
November	9.2	+ 0.5	13.4	4.4	2.9	+ 0.6	9.6	- 4.0	6.0	7	6.3
December	8.0	+ 0.8	12.3	1.4	2.3	+ 0.4	8.5	- 2.7	5.2	11	3.9
Year	12.3	0	24.8	0.8	4.6	- 0.3	15.8	- 6.5	8.4	60	8.9

Monthly Temperatures (Stirling, Parkhead) 1980

	Mean °C Maximum	Highest Maximum	Lowest Maximum	Mean °C Minimum	Highest Minimum	Lowest Minimum	Mean °C	Number of Air Frosts	Mean Relative Humidity 0900
January	—	—	—	—	—	—	—	—	—
February	—	—	—	—	—	—	—	—	—
March	—	—	—	—	—	—	—	—	—
April	—	—	—	—	—	—	—	—	76
May	13.9	21.5	7.7	2.9	8.0	-2.0	8.4	5	74
June	13.5	22.5	8.0	6.9	15.9	2.4	10.2	0	79
July	14.3	21.0	8.8	7.7	14.7	2.5	11.0	0	79
August	15.3	19.0	11.5	9.3	13.9	1.0	12.3	0	82
September	13.1	16.0	10.8	9.1	12.2	5.8	11.1	0	89
October	7.7	11.6	4.0	3.5	9.5	-0.5	5.6	3	84
November	5.0	10.1	0.2	1.2	7.5	-4.0	3.1	13	84
December	4.3	8.5	-1.0	0.5	6.5	-5.0	2.4	16	85

Monthly Temperatures (Ochil Hills, Carim) 1980

	Total Precipitation (mm)	Difference from Average (1971-80)	Greatest Fall in 24 hours		Number of days			
			Amount (mm)	Date	Precipitation Recorded	0.2mm or more	1.0mm or more	5.0mm or more
January	63.4	-	37.2	3rd	13	13	11	4
February	80.0	+	9.2	9th	18	17	16	7
March	80.1	+	9.0	17th	19	19	18	6
April	3.7	-	36.4	14th	4	4	2	0
May	9.7	-	45.6	27th	6	5	2	1
June	75.4	+	23.9	14th	19	19	15	6
July	50.3	+	11.5	30th	19	17	9	4
August	57.7	-	4.3	29th	15	15	12	4
September	88.3	+	12.5	11th	22	22	17	9
October	79.0	+	3.6	6th	19	16	14	7
November	125.5	+	25.8	25th	19	18	16	9
December	116.5	+	30.0	14th	20	18	15	11
Year	829.6	-	21.0	11th Sept.	193	183	147	68

Monthly Precipitation (Stirling, Parkhead) 1980

	Total Precipitation (mm)	Greatest Fall in 24 Hours		Number of Days		
		Amount (mm)	Date	0.5mm or more	1.0mm or more	5.0mm or more
January	—	—	—	—	—	—
February	—	—	—	—	—	—
March	—	—	—	—	—	—
April	1.5	0.5	22nd 24th 29th	3	0	0
May	17.0	9.0	27th	8	3	1
June	74.0	11.5	5th	18	16	7
July	116.5	23.0	3rd	19	16	9
August	79.0	18.0	29th	17	16	6
September	183.5	32.5	26th	24	23	14
October	105.0	21.0	3rd	17	14	9
November	138.0	23.5	16th	20	17	12
December	193.0	22.0	14th	21	18	12

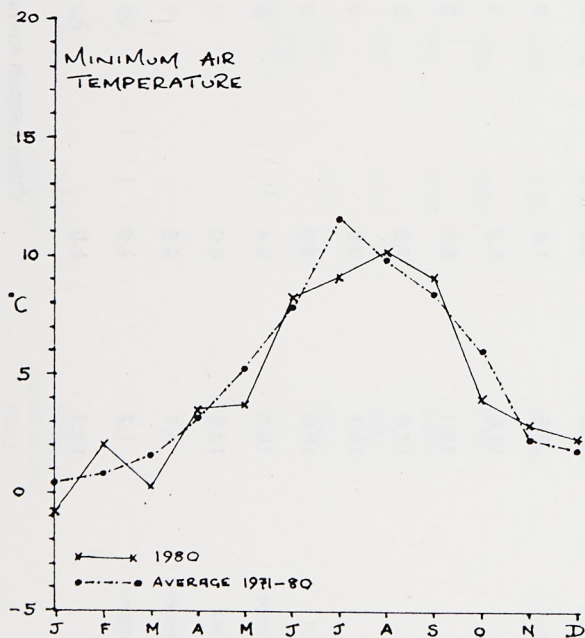
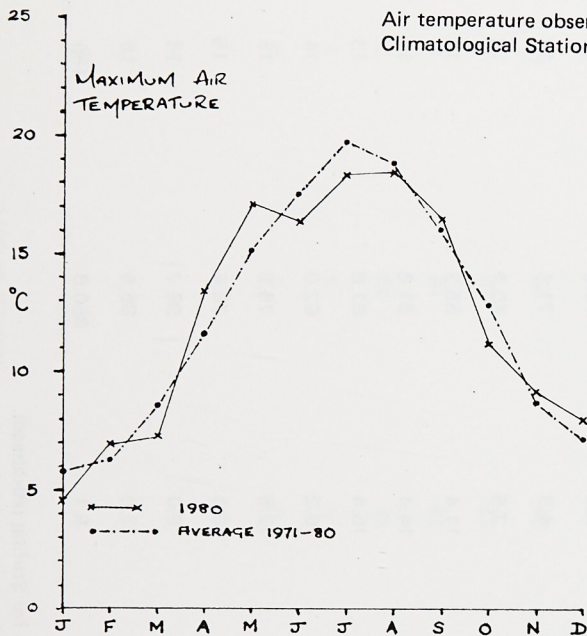
(* Instrument faulty)

Monthly Precipitation (Ochil Hills, Carim) 1980

	Maximum Air Temperature °C	Minimum Air Temperature °C	Number of Air Frosts	Earth Temperature (0900)	30cm Temperature	Total Precipitation (mm)	Number of days with precipitation
January	5.8	0.4	13	3.0		100.6	19
February	6.3	0.8	11	2.8		70.8	17
March	8.6	1.6	9	4.3		71.1	17
April	11.6	3.2	3	7.5		40.1	12
May	15.1	5.3	2	11.4		55.3	14
June	17.5	7.9	0	14.4		51.5	14
July	19.7	10.6	0	16.4		61.8	13
August	18.8	9.9	0	16.2		62.0	14
September	16.0	8.4	0	13.6		75.8	15
October	12.8	6.0	3	10.3		75.4	15
November	8.7	2.3	9	6.0		99.7	18
December	7.2	1.9	10	3.8		86.5	18
Year	12.3	4.9	60	9.1		850.6	186

Climatological Averages for Stirling (Parkhead)
University of Stirling 1971-1980

Air temperature observations at Parkhead
Climatological Station University of Stirling



Observations at Parkhead Climatological
Station University of Stirling

