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THE CLIMATE AT AND AROUND NETTLECOMBE COURT, SOMERSET

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A Meteorological Office climatological station was established at Nettlecombe Court in the spring of 1968, and gave interesting data, particularly about the local temperatures. A second station was established at an upland site within a mile of the first in the summer of 1971. The information provided by these two stations, with records of temperature and rainfall for a number of other localities, has proved sufficient for the general characteristics of the local climate to be understood, even though the records cover such a short time.

Despite being quite close to the sea, in the south-west peninsula, the lowland site has an unusually wide range of temperature and is remarkably susceptible to ground frosts, which can occur in any month of the year. A temperature inversion occurs on about 60 per cent of all nights. The average minimum temperatures for the upper site are sometimes high enough to offset the lower average maximum temperatures, and so produce a higher mean monthly temperature for the higher site. This illustrates well the danger of quoting mean monthly figures to describe a climate without reference to physiographical and other local circumstances.

Introduction

The climate of an area is an important aspect of the environment, because it affects the characteristics of the soil, and so has an impact upon the flora and fauna. In many cases the occasional meteorological extremes may themselves be limiting factors, but whether dealing with long-term averages or short-term fluctuations one needs information about the general climate of the working area, as well as details of local variations from the regional pattern.

Standard descriptions of the climate of the south-west peninsula are based on generalized data from predominantly coastal sites, which use warm summers or long hours of sunshine as a commercial boost. In 1971, of the 42 Met. Office recording stations in Somerset, Devon and Cornwall, only 21 were away from the coast, and of these eleven were in Somerset. The only two stations in west Somerset were at Nettlecombe, and at Hawkridge, some 300 metres above sea-level on the southern fringe of Exmoor. A third station was set up close to Nettlecombe during that summer. A comparison of data published in the *Monthly Weather Report* (Met. Office, 1968-71) with observations made at Nettlecombe Court since May 1968 suggests that the inland climate may differ substantially from the climate of the coastal strip.

This paper places Nettlecombe in a regional context and shows how it accords with or diverges from the regional patterns. The local records to date suggest that anomalies, notably those due to topography, are particularly marked in the immediate vicinity of Nettlecombe Court.

Nettlecombe Court is 4 kilometres south-west of Williton, at ST 057378, about 95 m. above sea-level, in the bottom of a valley (Fig. 1a) which runs roughly south-west to north-east from Chidgley ("E") to Woodford ("C"), to join a larger south-east to north-west valley from Monksilver ("F") to Yarde ("D"), where it narrows

and turns sharply towards the north-east. The land to the south and west of the Nettlecombe valley rises to about 300 m., while the valley floor is made irregular by a series of minor ridges and hollows, most of which drain towards the Court. Generally the height decreases northwards from Nettlecombe, towards the Bristol Channel, while farther to the south and south-west the upland block of the Brendon Hills, an eastward extension of Exmoor, rises to over 400 m.

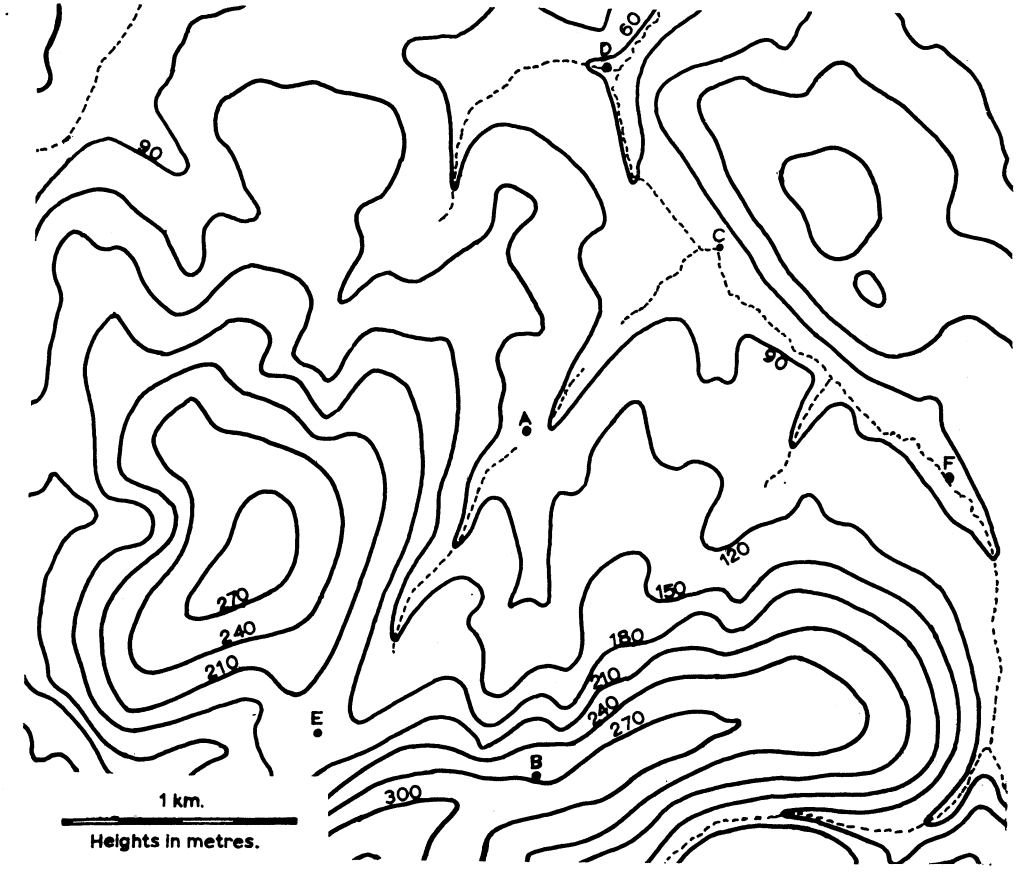

FIG. 1a.
The generalized relief of the Nettlecombe area.

The Field Centre now holds an almost unbroken climatological record from July 1968 for the lowland site, and from July 1971 for the upland one ("B" in Fig. 1a), which is near the top of the ridge almost due south of the Court, and at about 270 m.: the climates of these two will be discussed in detail later. The whole area under consideration lies within 8 km. of the Bristol Channel coast, but the neighbouring uplands shelter it slightly from the truly maritime west and south-west winds. North-east winds are dominant locally, being funnelled up the valley, particularly sea-breezes under anticyclonic conditions in summer, although sea-fog is rare so far inland.

A possible long-term mean monthly temperature curve (Fig. 2) was extrapolated

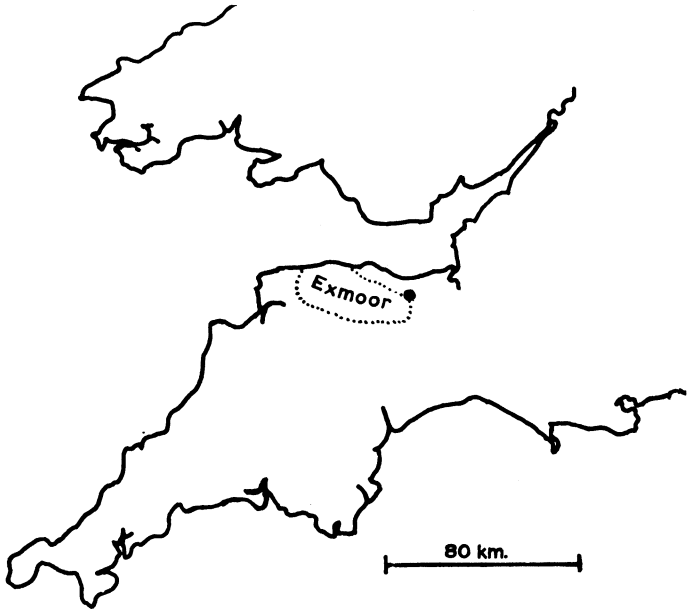

FIG. 1b.
The location of the Nettlecombe area in south-west Britain.

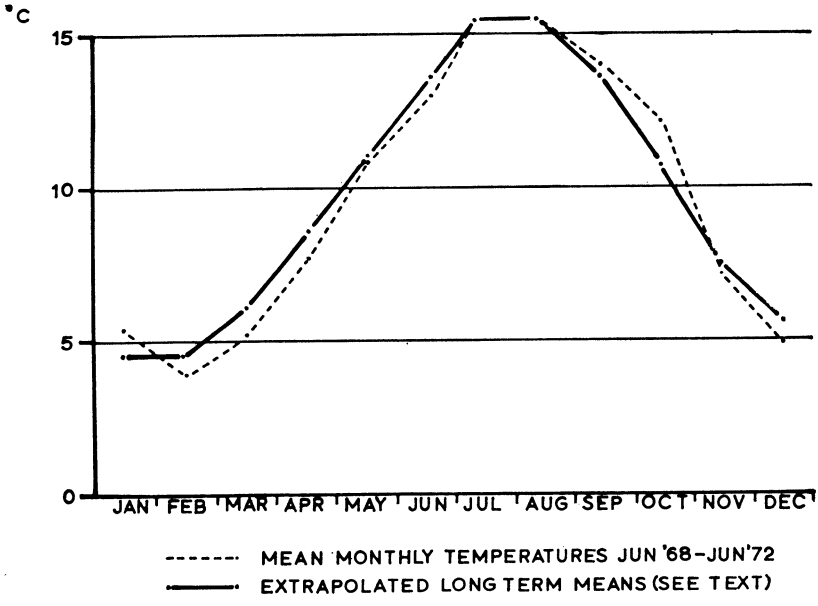

FIG. 2.
Curves of mean monthly temperatures, Nettlecombe Court.

from the four-year figures. These were weighted with the 1968–1971 monthly average deviations from the 30-year mean figures recorded at a number of long-established West Country stations. (See Appendix I.) This produced a very smooth curve, and the technique has been applied with equal success to data from other sites, suggesting that it may be a valid method of calculating long-term averages. In fact, the mean monthly temperature may obscure important climatic characteristics, particularly the average range of temperature, and predictable extremes may be more significant than averages in defining the climate of a particular area.

The calculation of average rainfall presented more problems, the distribution and intensity of precipitation during the study period having diverged markedly from the expected pattern, often with large variations within a very small area. For example, there have been three falls of 70 mm. or more in 24 hours during the study period, each of these falls making a month that was very dry in terms of rain-days into a wet one in terms of total precipitation. Monthly totals have ranged from 10 to 200 mm., and only an approximate annual pattern of rainfall can be produced by weighting these figures with longer term records from other places.

The climatological data used in this study are summarized in Tables 1–3 in Appendix II.

TEMPERATURES

Table 1 gives a full breakdown of Nettlecombe temperatures, compared with the most maritime (Old Cleeve) and the least maritime (South Brewham) Somerset sites for which records are available. Old Cleeve is about 4·5 km. from Nettlecombe and 1·5 km. from the coast, being exposed to marine influences. South Brewham is in the lowland belt between the south-eastern end of the Mendips and the extreme western edge of Salisbury Plain, where a number of sites experience wide ranges of temperature and unusual extremes. The contrasting temperature regimes are shown in Table 1, C–G. Although the mean monthly temperatures for Nettlecombe suggest a very moderate climate, some of the extremes that characterize South Brewham appear in Table 1, E–G. Old Cleeve strongly resembles Dale Fort (Oliver 1959) in its mean daily maxima and minima and in its mean maximum and minimum for the year. Frost is notably scarce there, with ground frosts rare between March and mid-November, whereas South Brewham can expect a slight air frost in any month. Ground frost at Nettlecombe is unlikely from 14 June to 6 September, having happened only six times in five summers.

The wide range of temperature, and in particular the very low minima, may be the result of the local topography. Under a clear sky the maximum temperature is high in the sheltered hollow of Nettlecombe, while at night under the same conditions outward radiation from the surrounding slopes is very rapid and the cooled air collects in the valley-bottom, giving a marked temperature inversion. Katabatic winds have been observed within 30 minutes of the disappearance of the sun beneath the local horizon: in the autumn of 1971, when vegetation was burnt during settled weather, the smoke from the fires was seen flowing down the valley sides and collecting around the Court.

Topography also frequently affects moist south or south-west winds: these descend rapidly from the Brendons, so that the air is warmed adiabatically, often giving a temperature difference of 2 °C. between sites "A" and "B". With a clearing sky in the lee of the hill, increased sunshine can double this difference. Site "A", being

in the valley, has such a late winter sunrise and early summer sunset that any sunshine records would have very little meaning: even in midsummer it receives no direct radiation after about 1900 G.M.T., which doubtless encourages rapid cooling of the air in the valley.

The extremes of temperature so far recorded occurred with the invasion of the area by unusual air-masses, the local topography having an exaggerating effect. The absolute maximum of 29·2 °C. on 7 July 1970 was associated with a very warm continental air-stream. The absolute minimum of −10 °C. on 30 January 1972 (grass minimum −14 °C.) was caused mainly by extremely cold air circulating round a high-pressure system over Scandinavia.

A wide diurnal range is normal, as shown in Table 1, E. On nine occasions the range exceeded 17 °C. (30 °F.), and on 66 it was between 14 and 17 °C. (25–30 °F.). The extreme range, on 5 October 1971, was from 20·4 to 1·2 °C., while a range of almost 22 °C., spanning two recording days, occurred twice, neither occasion being the result of a sudden change of air-mass. Although hardly comparable with records from the Rickmansworth frost-hollow (Hawke, 1933, 1944) the conditions at Nettlecombe Court are analogous to those at several sites in east Somerset, at Boscombe Down and Upavon in Wiltshire, and others as far north as Wittering in Northamptonshire.

Frequency of Frost and the Length of the Growing Season

At Nettlecombe the season of grass growth lasts from mid-March until early November. Each winter has included a spell with average temperatures above 6 °C., the threshold value for grass growth: in 1969 grass was growing for most of January, but then not again until early April. In December 1971 site "A" had only three air frosts, grass grew vigorously, and a hawthorn bush put out new leaves, which later frosts killed. At places nearer the coast, such as Old Cleeve and Minehead, grass may start growing a month earlier and continue a month later than at Nettlecombe. The commercial growing of apples, soft fruit and vegetables is restricted to this coastal strip.

No air frost has been recorded at Nettlecombe between 11 May and 4 October. Table 2, C, shows that only July and August can expect to be entirely frost free, while ground frost can be expected on every other night from November to April inclusive. The high average for February is the result of 22 consecutive nights with frost in 1969, followed by 24 frosts in February 1970. June 1972 was the coldest for many years with three ground frosts, and the grass minimum fell to −1·4 °C. on the night of the 29th. Grass minima of 0·0 °C. on 21 July 1970, and −0·8 °C. on 11 August 1972, occurred with cool, clear polar maritime conditions following depressions.

The least frosty winter months so far recorded were November 1970 (0 air frosts, 3 ground frosts), and December 1971 (3 air frosts, 9 ground frosts). Both these months were dominated by winds from between south and west, and average temperatures everywhere were well above normal.

Relative Humidity and Weather Patterns

The graphs in Fig. 3 illustrate the humidity characteristics of the different air masses commonly experienced in the area. The mean figure for relative humidity at 0900 G.M.T. is 84 per cent, the highest being 100 per cent and the lowest 55 per

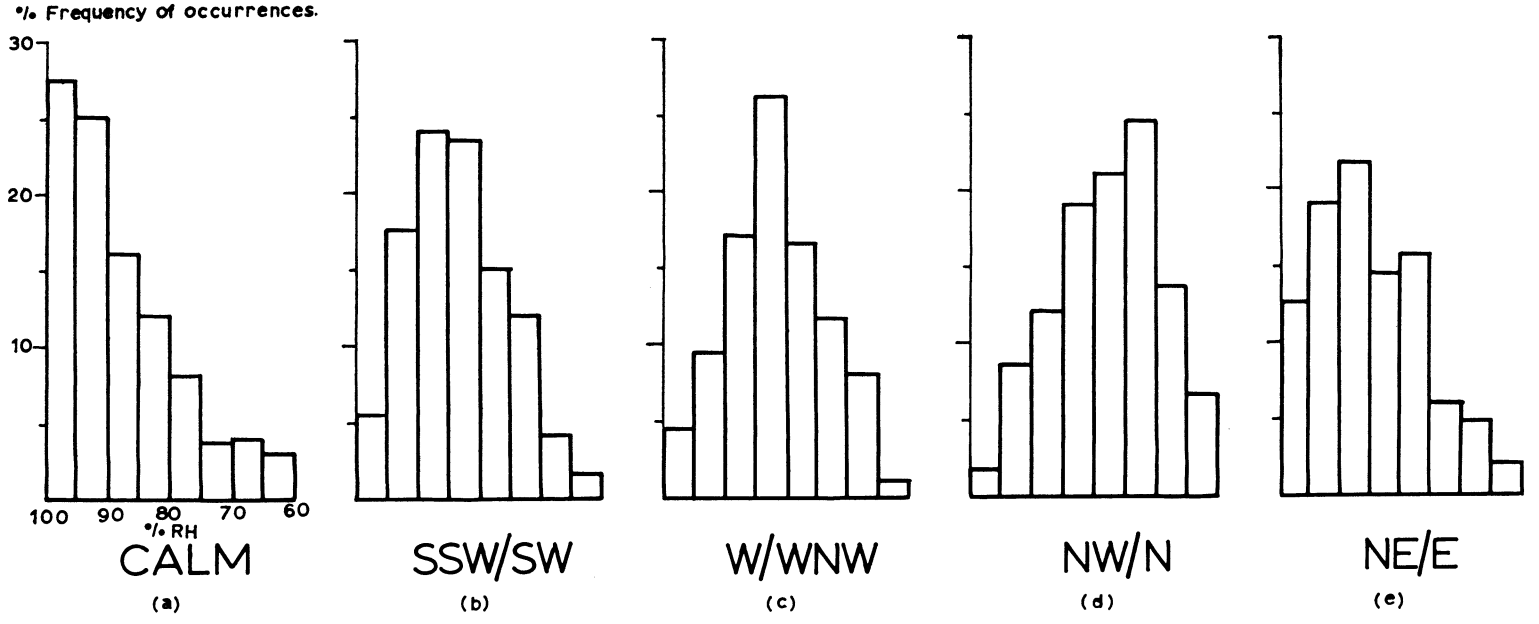

FIG. 3.
The relationship between wind direction and relative humidity at 0900 G.M.T. at Nettlecombe Court.

cent. Under calm conditions the R.H. is more than 90 per cent on more than half the total occurrences. Twenty-eight per cent of all calm days have fog or mist (visibility less than 2 km.), which corresponds closely to the figure of 27 per cent of all calm days having a humidity of 95 per cent or more. Such conditions result either from cooling by radiation at night, or from the arrival of a very moist maritime air-stream, as in the warm sector of a depression.

Winds of south-westerly origin normally have a slightly lower R.H., about half the occurrences falling between 80–90 per cent R.H., and occasionally this air has an exceptionally low relative humidity, having been warmed adiabatically in its descent from the hills; most values of less than 60 per cent occurred in this way.

The graphs suggest a tendency for relative humidity to decrease as the air-stream has a progressively more northerly origin, so that winds arriving from near north have an average of only 75 per cent at 0900. Such an airstream is normally of polar origin, being cold and probably unstable, but retaining little moisture after passing over the Welsh mountains. A good example of these conditions was on 1 April 1970, when snow showers in the morning cleared to give a fine afternoon with visibility more than 100 km. from the top of the hills.

The slightly moister west to north-west polar maritime air-streams are cool and unstable, having travelled over relatively warm water. A typical day will begin fine after overnight rain, with cloud increasing during the morning to give showers by noon, but often clearing again by evening; as atmospheric turbulence decreases the likelihood of frost in the valley increases.

North-east to east winds have a markedly higher average humidity than those from the north. They are polar in origin and are common in winter and spring on the flanks of a Scandinavian anticyclone, usually giving cool cloudy weather at Nettlecombe. They pick up a certain amount of moisture in crossing the North Sea, and become slightly unstable as they travel down the warm Bristol Channel. Condensation takes place as the air rises up the flanks of Exmoor, resulting in the high incidence of fog. A less frequent weather situation, giving damp north-easterly winds, occurs when a depression tracks eastwards along the English Channel in summer, usually being associated with thundery thermal low-pressure areas over the Continent. Such depressions usually move slowly, and, being composed almost entirely of warm air, they can contain large amounts of moisture and give exceptional falls of rain. Any frontal disturbances can be exaggerated by the effects of relief, while convectional activity over the warm land can generate major thunderstorms. This combination of processes is probably responsible for Somerset's record of heavy falls of rain: three of the heaviest falls recorded in Britain—all in excess of 200 mm. in 24 hours—were within the county.

Rainfall

The overall rainfall pattern is characteristic of a site in the south-west. From June 1968 to June 1972 there was precipitation on 46·5 per cent of all days, or about 170 days a year. The totals for each month and the monthly averages for the period are shown in Fig. 4, but, for the reasons already given, these averages do not represent a long-term pattern of distribution. However, certain patterns do appear. The period of maximum rainfall is from November to January, with decreasing amounts from February until June, then often a slight increase in July and August as more unstable conditions result from the build-up of heat in both land and sea. This is

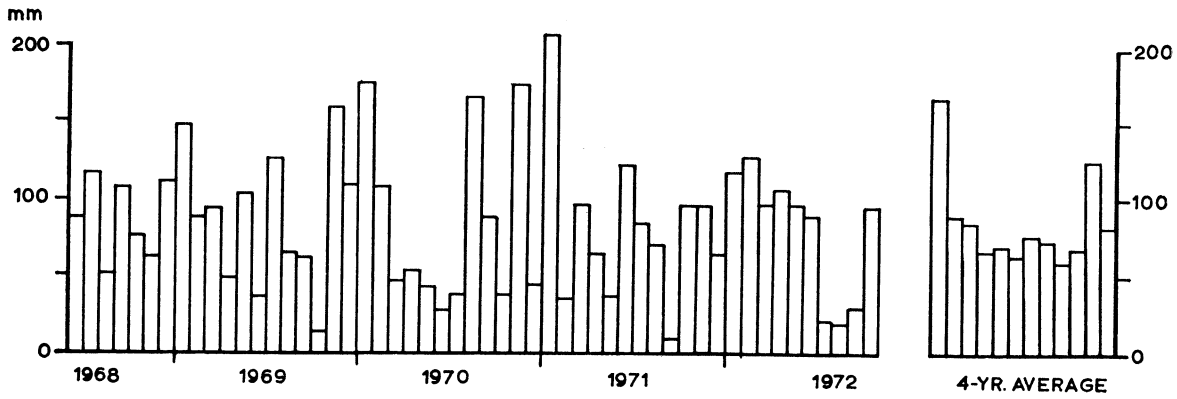

FIG. 4.
Monthly rainfall, Nettlecombe Court.

followed by a drier period of more settled weather in September, that has twice lasted well into October, although in the decade 1962–1971 October was one of the wetter months.

Analysis of the occurrence and intensity of precipitation reveals some patterns that are masked in the generalized monthly data. Fig. 5 shows three complementary "rain-roses", 5a being the percentage of precipitation that comes from each direction, confirming that most rain falls in the south-west when the wind is between west and south. Fig. 5b emphasizes this, in showing the distribution of rain-days with different winds, but 5c shows a different pattern for the mean size of fall per rain day. Although north-easterly winds bring less than 2 per cent of the annual rain-days, the quantity of rain averages 12·5 mm. per rain-day. Exceptionally heavy and prolonged rainfall can occur when a depression passes to the south of Britain, as described above. At Nettlecombe a fall of 72 mm. in less than 12 hours happened on 10 July 1968, one of 120 mm. on 28/29 July 1969, and one of 100 mm. on 19/20 August 1970. The last two each spanned two recording days, and therefore appear in the records as two separate falls. A thunderstorm in the summer of 1971 gave 46 mm. in less than two hours, while on the same day a site about 2 km. south-west of Nettlecombe recorded 40 mm. in 14 minutes. However, falls with a "normal" south-westerly wind rarely exceed 25 mm., the heaviest being 37 mm. An analysis of occurrence shows that while measurable rain falls on 46·5 per cent of all days, 45 per cent of these days have less than 2·5 mm. (Fig. 5d). There is only a 1·7 per cent probability of rainfall exceeding 25 mm. on a single day, but these heavy falls average almost 40 mm., and together they account for more than 15 per cent of the total precipitation.

WIND

There is no anemometer at Nettlecombe, so all recordings of wind speed and direction are subjective. The data are summarized in Fig. 6; more than 20 per cent of days have a south-westerly wind, particularly in the winter months. Surprisingly, winds from the north and north-east together account for 25 per cent of the total. This may be partly the result of several very anticyclonic months during the period, dominated by winds from that quarter. Fig. 6a suggests the importance of high

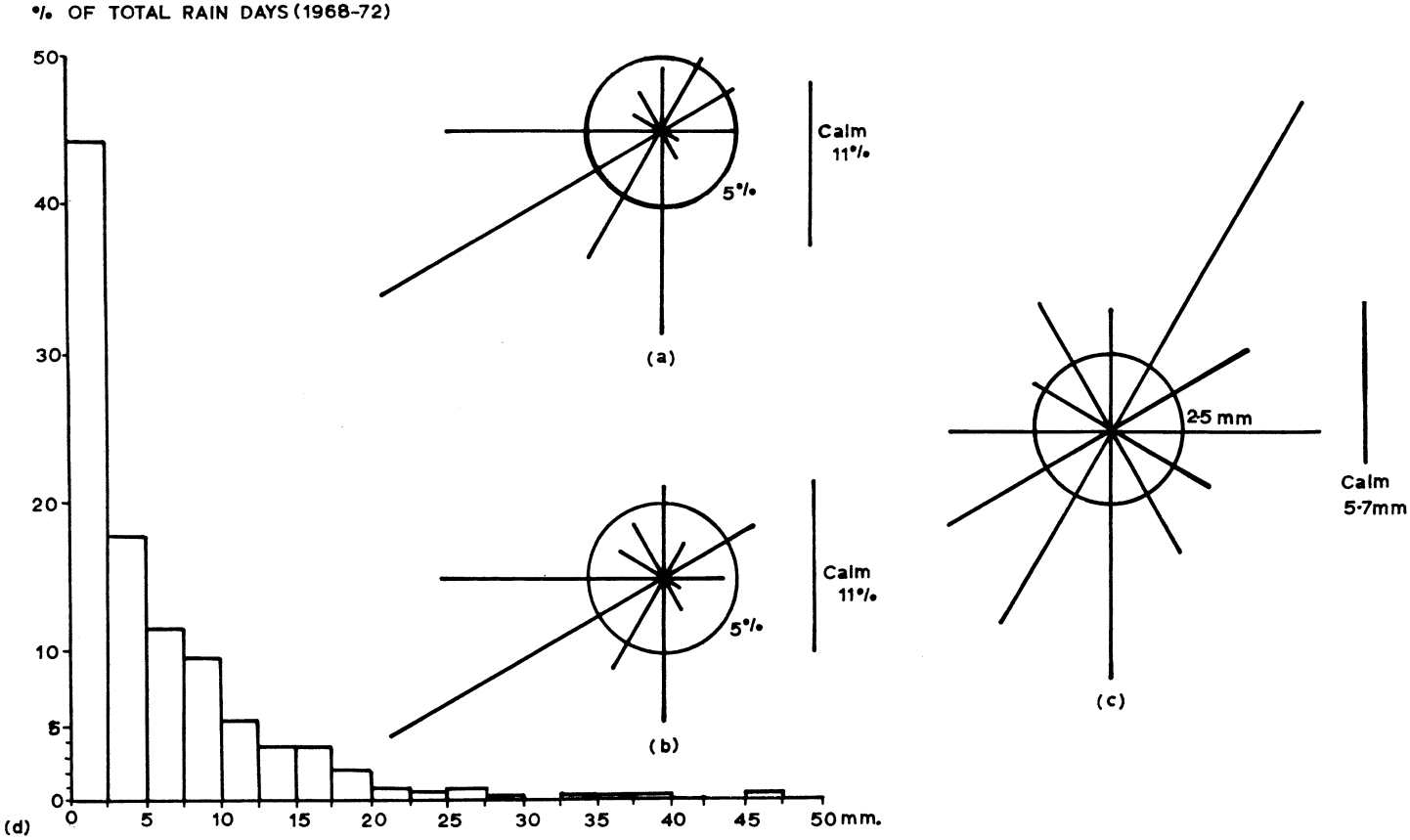

FIG. 5a.
"Rain-rose" showing percentage distribution of annual precipitation with wind direction.

FIG. 5b.
"Rain-rose" showing percentage distribution of annual total of rain-days with wind direction.

FIG. 5c.
"Rain-rose" showing mean precipitation per rain-day, with wind direction.

FIG. 5d.
Percentage frequency of falls of different amounts.

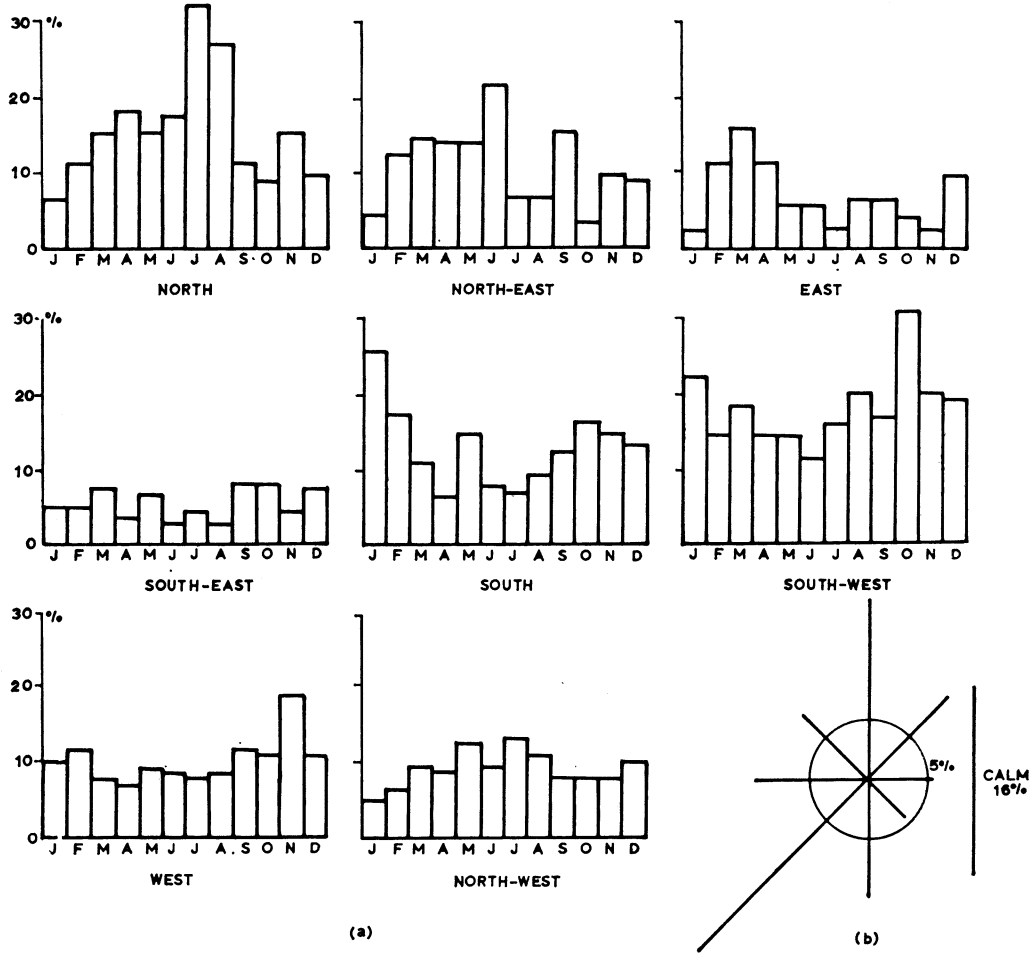

FIG. 6a.
Monthly frequency of wind directions as percentage of annual total occurrences.

FIG. 6b.
Wind-rose of winds observed at 0900 G.M.T. for the period June 1968–June 1972.

pressure over the North Atlantic in summer, giving north or north-easterly winds, and the influence of Scandinavian anticyclones producing the highest proportion of easterly winds from February to April. The slightly higher proportion of winter westerlies is associated with the increased cyclonic activity in that season.

LOCAL CLIMATIC VARIATIONS

Some of the characteristics of the climate at Nettlecombe Court are more intelligible if compared with sets of data from other local recording sites. Reference has already been made to the broad variations that exist within the region, and in particular to the contrasts between coastal and inland sites. There are also variations with altitude, and it was largely to obtain accurate data on the climate of the hills that Site "B" was established, and already enough information has been accumulated to make some comparisons between temperatures and rainfall at Site "A" and Site

"B". Also, some figures are available for a site in Monksilver ("F" in Fig. 1a) and, although the thermometers here are exposed on a north-facing wall, instead of in a standard pattern screen, tests suggest that the data represent local conditions. Thermometers in a screen usually experience fewer extremes, being unaffected by back-radiation or by contact with the radiating surface. The expected tendency is in this case reversed, the extremes being greater in the screen than on the wall. Certainly, the exact nature of the recording site must affect the temperature regime, and in an area of such varied topography as around Nettlecombe, it is difficult to decide that any recording site would truly represent the climate of the area.

Table 3 in the Appendix summarizes comparative records for the two Nettlecombe stations over a period of especially variable weather. July 1971 was the warmest month so far recorded at Nettlecombe, and September the driest. December was exceptionally mild, while May and June 1972 were unusually cold and unsettled, to be followed by an equally unusual dry spell that lasted into October. Thus while the period cannot be considered representative of the climate of either site, relationships between the characteristics of the two sites have been demonstrated for a wide variety of weather patterns.

In Table 3, A, the most notable feature of monthly average temperatures during the period is that the values for September in both years is greater at Site "B" than at Site "A". Fig. 7 helps to interpret this anomaly. Under the clear anticyclonic conditions that prevailed for most of the months in question, night-time outward radiation produced a temperature inversion in the valley on almost every occasion. The average diurnal minimum at Site "A" was 2·8 °C. lower than at Site "B", and this more than offset the higher average maximum at Site "A". This is emphasized in Fig. 8a, in which, of a random sample of 60 daily maxima, only one is the same for both sites. The remainder are greater at Site "A", the average difference being 1·8 °C. Minimum temperatures do not show such a clear pattern, the differences between the sites being least when conditions are dull and disturbed, as in the first half of 1972, and greatest when the weather is clear and settled. Only the fine spell in the Middle of March 1972 broke a period of several months with unusually high rainfall, and a normal positive lapse rate occurred between the two sites on the majority of nights. Fig. 8b, using the same randomly selected sample as 8a, in fact shows two statistical populations. One set of data—for when Site "B" is markedly warmer than Site "A"—refers to settled conditions with a temperature inversion, while the other set is for cloudy conditions, with the higher values being at Site "A".

The characteristics of mean range of temperature shown in Table 3, B, are not surprising. For the period studied, the average diurnal temperature range at Site "B" was 0·65 × Site "A", an index that corresponds very closely with that of Old Cleeve. The values ranged from 0·79 in May 1972 to 0·55 in September 1971 and September 1972, the divergence being predictably most pronounced during spells of fine weather. With minimum temperatures being so much lower in the valley, it is not surprising that, in the first full year of comparable recordings, Site "A" experienced 50 per cent more ground frosts than Site "B". September 1972 was of below average warmth, mainly because of cold nights which produced 12 ground frosts at Site "A", against only one at Site "B". (See Table 3, C.)

Precipitation at the two sites also shows frequent variation, although the upland total is higher for almost every month. Table 3, D, compares the amounts recorded at the sites between July 1971 and October 1972: in the wetter months Site "B"

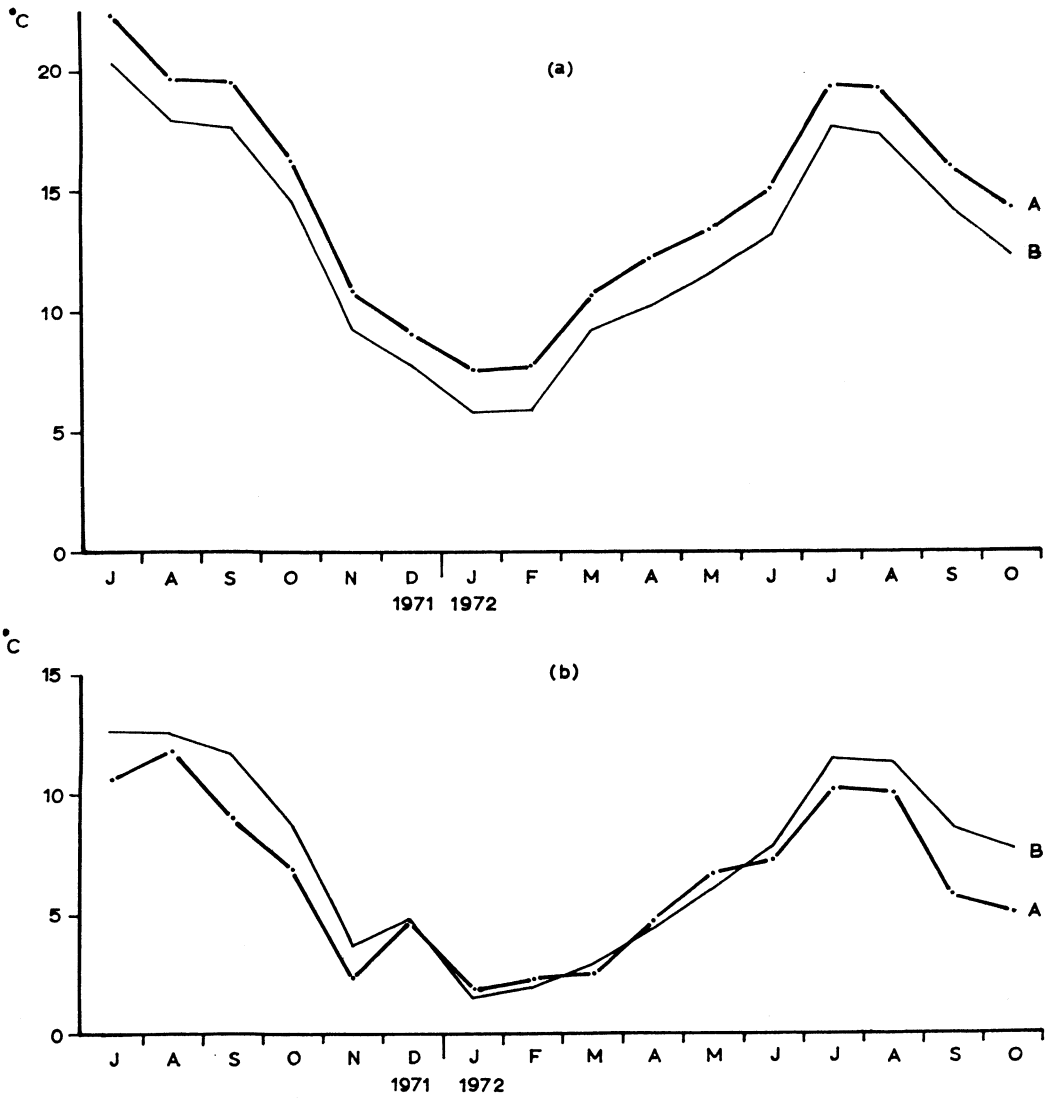

FIG. 7a.
Comparison of monthly averages of daily maxima at Sites "A" and "B".

FIG. 7b.
Comparison of monthly averages of daily minima at Sites "A" and "B".

may have an excess of 20 per cent. Fig. 9 compares 60 randomly selected falls of rain and shows that, while about one fall in five is greater at the valley site, the hill site receives a very considerable excess of precipitation on about one occasion in ten, so that the overall total for that site is greater on average by over 12 per cent.

The intensity of precipitation is often markedly greater at Site "B", especially under the unstable conditions in the cold sector of a depression, and the frequency of snowfall is also very much greater than at the lowland site. Snow seems to be more frequent, and heavier, on this particular ridge than farther south on the summits

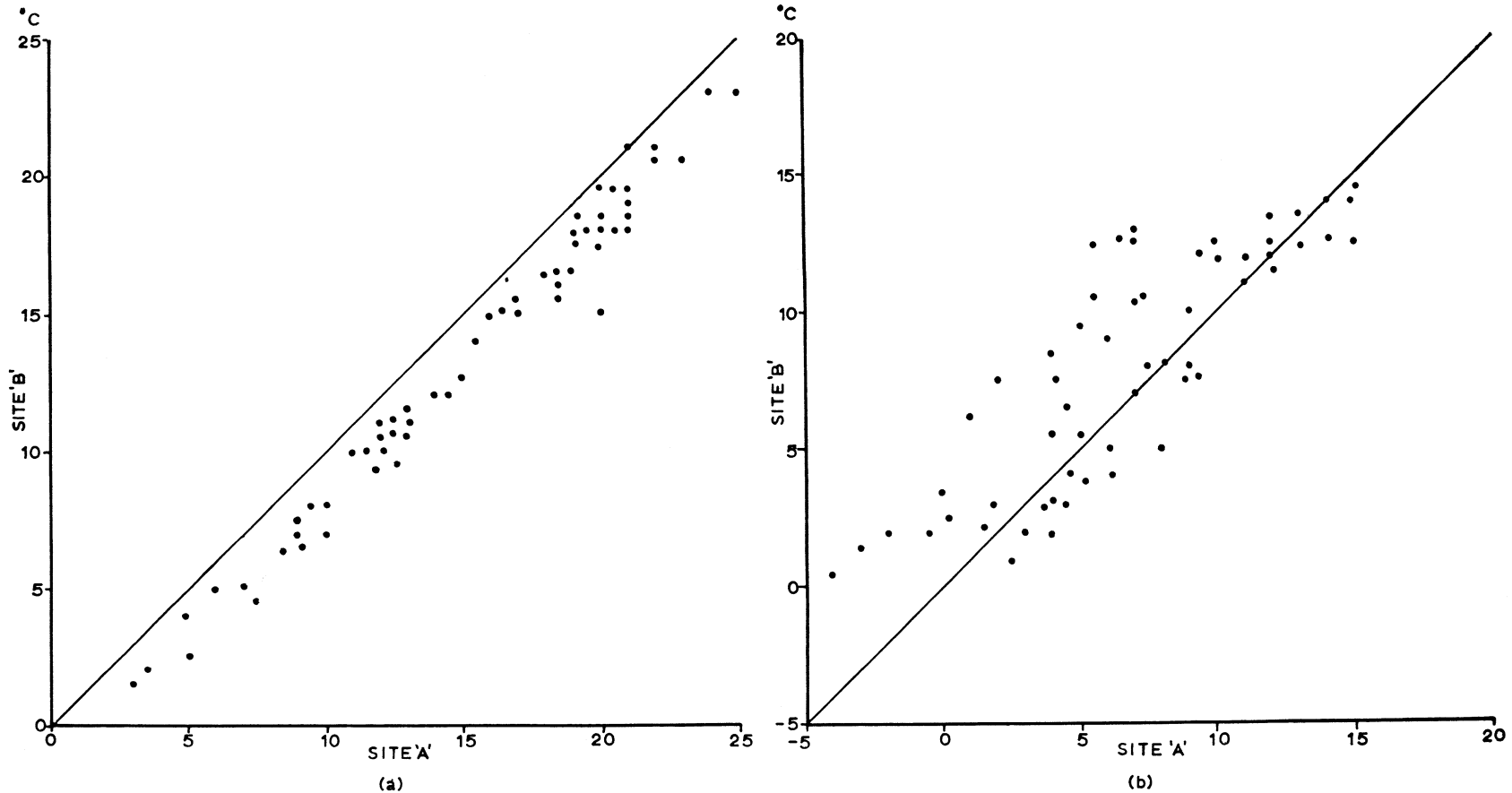

FIG. 8.
Comparison of temperatures at Sites "A" and "B", using a randomly selected sample of 60 days.

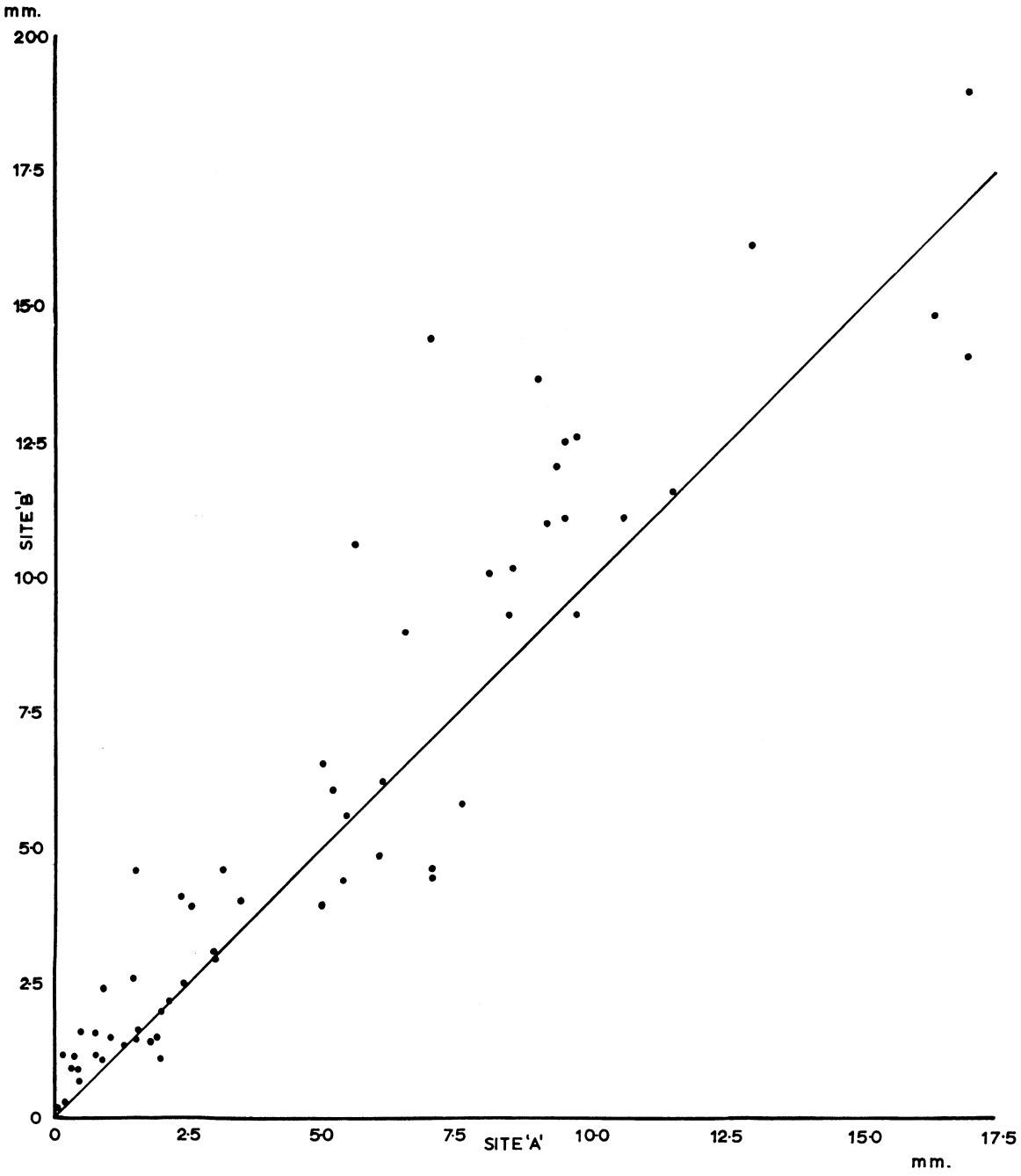

FIG. 9.
Comparison of amounts of precipitation at Sites "A" and "B", using a randomly selected sample of 60 daily values.

of the Brendons, over 100 metres higher, perhaps because "B" is exposed to the north or north-east winds which bring most of the snow to this part of the country.

Both gales and fog have been more frequent at Site "B", but many fogs go unrecorded because they occur before or after the observation hour, and gales on the hill-top may be of short duration and pass completely unobserved.

A basic requirement in the study of local climatic patterns within an area is the full analysis of the climate of one reference site. Thus, having carried out an exhaustive study of data for the site at Nettlecombe Court, one is in a position to state the probable long-term climatic characteristics of other sites from as little as a single year's data, by making comparisons, statistical or otherwise, with the "reference climate". This is especially true where data are abundant, as with daily temperatures and rainfall.

As an illustration of this technique, Fig. 10 has been produced, using the same sample of 60 days' temperature readings as in Fig. 8. This demonstrates that Site "F" in Monksilver village, has a slightly more moderate climate than does Site "A". The maxima tend to be slightly higher under cold conditions, but much lower on hot summer days, while the minima are generally higher. The patterns are not as clear as those in Fig. 8, but the surprising fact is that there is such frequent disparity of temperatures, considering that both sites are in valleys at about the same altitude. Buildings, walls and garden hedges in the village probably affect the movement of air there, whereas the area surrounding the site at Nettlecombe Court is relatively unenclosed.

Readings of daily maxima, minima and grass minima at Sites "A" and "F" over a period of two months, using a standard Met. Office grass minimum thermometer, show that the trends in Fig. 10 can be much more marked for short periods. During the two-month period, Site "F" had a lower maximum on all but nine days, but higher minima and grass minima on all but four days. Although the difference between maxima at the two sites was rarely more than 1 °C., the difference between minima reached 5 °C., and averaged almost 2 °C. The grass minima, however, showed even greater differences, with the readings at "F" averaging 3 °C. higher than at "A". The frequency of ground frost was correspondingly much greater at the latter site.

Above all, in studies of this nature it must be remembered that the data from a site may refer only to that precise spot, and that a point some yards away may have, for example, a markedly different temperature regime. Far from negating the value of such small-scale studies, this emphasizes the need for detailed climatic work in connection with studies of a small part of the landscape. Many organisms are extremely susceptible to climatic variations, and there may exist many as yet unrealized ecological relationships or distributions in which local climate is the critical factor. For instance, frosts being twice as frequent at Nettlecombe as in Monksilver, could it be that the non-existence of a village at Nettlecombe is in part because men shunned its cold climate?

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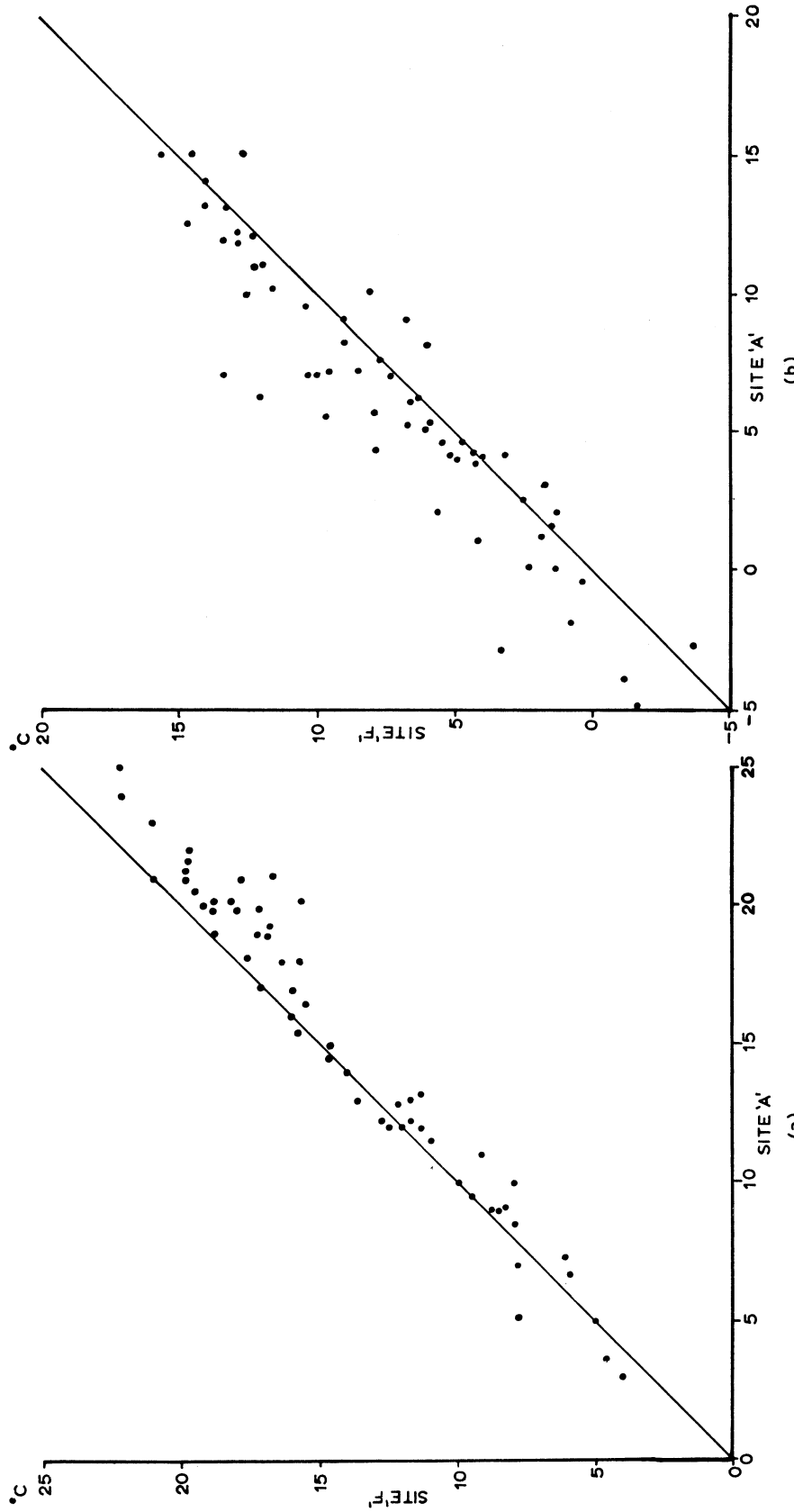

FIG. 10.
Comparison of temperatures at Sites "A" and "F", using the same sample as in Fig. 8.

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APPENDIX I.

The calculation of average monthly deviations from the long-term mean temperatures in the period 1968–1971 for seven sites in south-west England.

	J	F	M	A	M	J	J	A	S	O	N	D
Scilly	+0·9	−0·3	−0·9	−0·5	+0·3	+0·7	0·0	−0·1	0·0	+1·1	+0·1	−0·2
Falmouth	+0·7	−0·3	−1·6	−0·9	+0·1	+0·3	−0·2	−0·2	+0·1	+1·2	+0·1	−1·1
Plymouth Hoe	+1·0	−0·8	−1·6	−1·1	−0·4	+0·2	+0·2	0·0	+0·2	+1·3	0·0	−0·9
Tavistock	+0·7	−1·0	−1·9	−1·2	−0·2	−0·5	−0·4	−0·1	+0·3	+1·3	−0·3	−1·1
Weston-super-Mare	+1·1	−0·7	−1·6	−0·8	+0·4	+0·8	+0·1	+0·2	+0·4	+1·8	+0·1	−1·4
Long Ashton	+1·2	−0·9	−1·6	−1·0	+0·4	+0·4	0·0	0·0	+0·3	+1·4	+0·2	−1·4
Shaftesbury	+1·2	−1·0	−1·8	−1·2	+0·3	+0·4	+0·2	0·0	+0·3	+1·4	−0·2	−1·4
Average	+1·0	−0·7	−1·6	−0·9	+0·1	+0·5	0·0	0·0	+0·2	+1·2	0·0	−1·0

The bottom row of figures was used to weight the short-term averages for Nettlecombe Court, and produced the extrapolated curve in Fig. 2.

Note. Figures were not yet available for 1972, so the calculations had to be based on four years' data. However, some of the tables in Appendix II do include data for the Nettlecombe stations up to October 1972.

APPENDIX II.

Table 1. *Temperatures.* (*Degrees Centigrade*)

A. Monthly average temperatures, Nettlecombe Court.

	J	F	M	A	M	J	J	A	S	O	N	D	Year
1968	/	/	/	/	/	/	14·7	15·6	14·4	13·0	7·2	4·1	/
1969	6·3	1·9	4·4	7·8	11·0	14·0	15·7	15·4	13·5	13·0	6·3	4·4	9·7
1970	5·1	4·1	4·5	7·3	11·4	14·7	15·1	15·3	14·0	10·8	9·0	4·4	9·6
1971	5·4	4·8	5·1	7·5	10·9	12·3	16·6	15·7	14·2	11·7	6·5	6·9	9·8
1972	4·6	4·8	6·7	8·5	10·0	11·2	14·8	14·7	10·9	9·7	/	/	/

B. Mean monthly temperatures, Nettlecombe Court.

	J	F	M	A	M	J	J	A	S	O	N	D	Year
(i)	5·3	3·9	5·2	7·7	10·8	13·0	15·5	15·5	14·0	12·1	7·3	4·9	9·6
(ii)	4·5	4·5	6·1	8·5	10·9	13·7	15·5	15·5	13·7	10·7	7·5	5·6	9·7

(i) is the average for the period June 1968 to June 1972; (ii) is the long-term mean extrapolated in the way described in the text.

C. Comparisons of mean daily maxima (1968–1971).

	J	F	M	A	M	J	J	A	S	O	N	D	Year
Nettlecombe	8·5	6·6	8·0	11·7	15·7	18·9	20·4	19·6	18·2	16·0	10·4	7·5	13·4
Old Cleeve	8·2	6·5	8·0	12·2	15·7	18·1	20·2	18·5	17·7	14·7	10·3	8·0	13·2
South Brewham	6·1	5·3	7·5	12·2	17·3	20·3	21·7	19·7	18·0	14·7	8·2	5·4	13·0

D. Comparisons of mean daily minima (1968–1971).

	J	F	M	A	M	J	J	A	S	O	N	D	Year
Nettlecombe	2·8	0·4	1·2	3·3	6·1	9·1	10·6	11·6	9·7	8·2	4·1	2·2	5·8
Old Cleeve	4·2	1·5	2·8	5·6	9·3	12·1	13·8	14·3	12·5	10·3	5·5	4·4	8·0
South Brewham	0·9	−1·3	−0·7	1·6	5·5	7·8	9·5	10·9	8·0	6·7	1·8	1·3	4·3

APPENDIX II. Table 1—*continued.*

E. Comparisons of mean diurnal ranges (1968–1971).

	J	F	M	A	M	J	J	A	S	O	N	D	Year
Nettlecombe	5·7	6·2	6·8	8·4	9·6	9·8	9·8	8·3	8·5	7·8	6·4	5·3	7·7
Old Cleeve	4·0	5·0	5·2	6·6	6·4	6·0	6·4	4·2	5·2	4·4	4·8	3·6	5·2
South Brewham	5·2	6·6	8·2	10·4	11·8	12·5	12·2	8·8	10·0	8·0	6·4	4·1	8·7

F. Comparisons of average extreme maxima (1968–1971).

	J	F	M	A	M	J	J	A	S	O	N	D
Nettlecombe	13·2	11·0	12·1	17·6	20·9	23·6	27·0	25·0	22·3	20·4	16·0	12·8
Old Cleeve	13·0	11·0	14·0	17·5	20·4	23·1	25·7	23·7	21·3	19·4	15·4	12·7
South Brewham	11·6	10·0	12·2	18·4	22·7	25·5	28·5	26·4	22·2	18·8	14·3	10·7

G. Comparisons of average extreme minima (1968–1971).

	J	F	M	A	M	J	J	A	S	O	N	D
Nettlecombe	−0·4	−5·5	−5·6	−2·6	1·0	3·3	5·4	6·6	3·0	1·6	−3·0	−4·2
Old Cleeve	−1·0	−2·2	−2·2	0·6	4·0	8·4	11·0	11·0	7·3	5·0	0·0	−0·4
South Brewham	−8·5	−9·0	−8·2	−5·0	−1·1	1·8	3·3	3·3	1·1	−1·2	−6·7	−7·5

H. Absolute extremes, Nettlecombe Court (1968–1972).

	J	F	M	A	M	J	J	A	S	O	N	D
Maximum	13·3	12·2	17·3	18·1	20·5	24·5	29·2	25·8	23·6	22·0	16·6	14·3
Minimum	−10·0	−7·7	−7·2	−4·3	−0·4	2·3	3·8	3·9	0·5	−2·2	−5·6	−6·1
Grass minimum	−14·0	−11·5	−11·0	−7·0	−5·5	−1·4	0·0	−0·8	−4·5	−5·7	−10·0	−10·5

Table 2. *Rainfall and frost at Nettlecombe Court, 1968–1972*

A. Monthly rainfall (mm.).

	J	F	M	A	M	J	J	A	S	O	N	D	Year
1968	/	/	/	/	/	88	114	50	105	76	61	110	/
1969	147	88	93	49	103	35	127	65	61	13	160	110	1,051
1970	174	108	47	52	42	28	39	165	90	39	176	43	1,003
1971	206	33	99	63	36	121	84	71	10	98	99	62	979
1972	119	129	99	103	98	90	20	19	30	95	/	/	/

B. Average monthly frequency of frosts (1968–1972).

	J	F	M	A	M	J	J	A	S	O	N	D	Year
Air frost	7·0	11·1	9·0	4·7	0·2	—	—	—	—	(1)	5·5	11·0	38·5
Ground frost	16·5	20·5	17·5	15·0	6·5	1·5	(1)	(1)	4·0	7·4	13·2	18·9	124·0

(1) signifies an average frequency of less than 1·0.

Table 3. *Comparisons of data from Sites "A" and "B", July 1971 to October 1972*

A. Comparison of monthly average temperatures. (Degrees C.)

	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
"A"	16·6	15·7	14·2	11·7	6·5	6·9	4·6	4·8	6·7	8·4	10·0	11·2	14·8	14·7	10·9	9·7
"B"	16·4	15·1	14·7	11·4	6·5	6·3	3·7	3·9	5·6	7·3	8·8	10·3	14·5	14·3	11·3	9·9

B. Comparison of mean diurnal range, by months. (Degrees C.)

	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
"A"	9·4	8·0	10·9	9·5	8·4	4·6	5·6	5·4	8·1	7·5	6·9	7·9	9·2	10·9	10·3	9·3
"B"	7·4	5·5	6·1	5·7	5·6	2·9	4·2	4·2	6·3	5·7	5·4	5·7	6·2	6·1	5·6	5·7

C. Comparison of numbers of ground frosts, by months.

	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
"A"	/	/	4	10	24	9	19	16	19	12	5	3	/	2	12	12
"B"	/	/	/	2	15	8	15	12	16	10	2	/	/	/	1	3

D. Comparison of monthly totals of precipitation (mm.).

	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
"A"	84	71	10	98	99	62	119	129	99	103	98	90	20	19	30	95
"B"	84	88	10	111	98	76	138	140	105	120	116	111	18	29	37	108