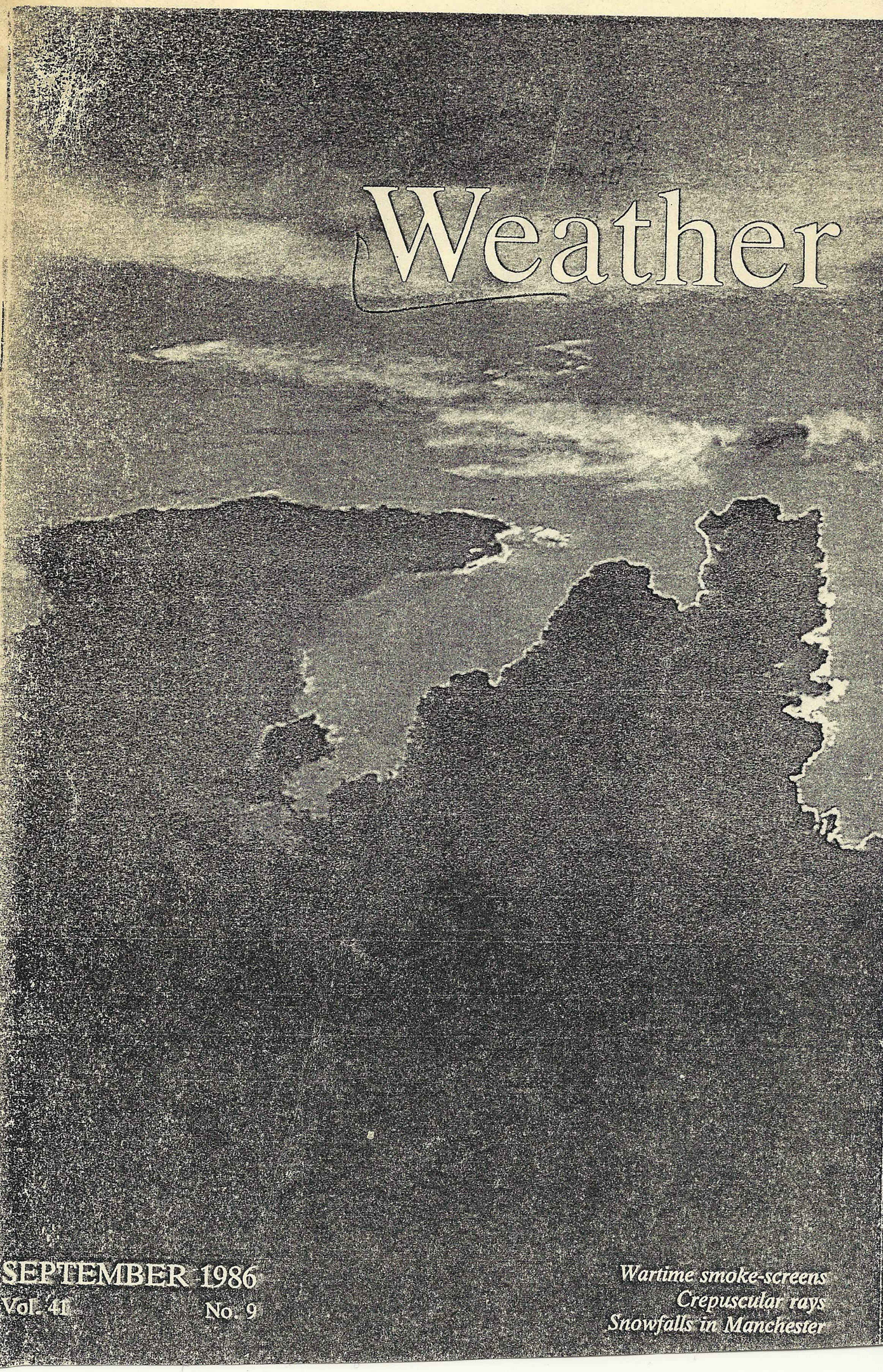
No. 15


Weather
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Wartime smoke-screens
Crepuscular rays
Snowfalls in Manchester

array which ran along two major roads through the town. The smell penetrated into a large cinema where the manager misguidedly switched on his full ventilation system; within minutes, the screen was invisible from the balcony and the box office was besieged by patrons demanding their money back. There was nothing we could offer the manager but sympathy. In general, no compensation whatsoever was paid to anyone for dirt and inconvenience, so I counted it as a minor triumph that after several months of argument I eventually succeeded in persuading the Ministry of Home Security to pay a few shillings for the cleaning of a raincoat that had inevitably become impregnated with soot and oil.

Perhaps the most difficult problem faced by meteorologists was the situation when radiation fog was expected to form during the burn period. Timing such events to the nearest 10 minutes was difficult if not impossible, despite almost continuous monitoring of visibility and humidity in the area. Usually, when fog was clearly imminent, we took a chance and gave orders for the pots to be extinguished, but if the fog beat us to it because we had allowed insufficient time for an officer to get round the circuit telling the Army 'minders' to stop making smoke, the results could be quite catastrophic. I can remember very vividly one occasion when the fog formed quite suddenly and became so thick that it was impossible to get round the circuit giving instructions to douse. Within an alarmingly short time, the mixture of fog and smoke reduced visibility in the town centre to literally no more than 2 yards; it took me about an hour to walk barely half a mile along a main road from where I had abandoned my car to our office in the High Street.

REFERENCE

Air Ministry (Air Historical Branch) (1954) *The Second World War 1939–1945: Meteorology*, pp. 215–219. (Unpublished, copy available in the National Meteorological Library, Bracknell.)

UNIFORM ICE STRIPES OVER GRASS

It is not so rare but still very interesting to find the earth covered with a thin layer of ice on the early morning following a clear cold night in the coastal plane of Israel. But is quite surprising to find the ice organised in parallel equi-distant ($\sim$ half a metre) lines right over the grass of about 600 m^2 in area in front of my country-side house. Although an hour had passed after sunrise, these lines were observed, see Fig. 1, at about 0730 LST on the morning of 30 of December 1984. The two mercury thermometers in the picture were placed right between two stripes 25 minutes past sunrise, i.e. at 0700 LST. One of the thermometers lying right beneath the grass with its mercury ball in the grass while the second thermometer was set at the height of about 24 cm above the surface as part of the meteorological set of instruments as seen in Fig. 1.

A clue to the existence of the ice stripes enigma is found in our 19″ Harry lawn mower which cut the grass two days before the ice occurrence. Being in a hurry while mowing the grass with Harry, I didn't gather the mown grass which was left drying in the sun in uniform lines for the rest of that day and the morrow. The stripes were first observed before sunrise and were positioned centrally on the heaps of mown grass so were not due to a lack of melting in the shadow of the heaps.

So what is the reason for this mown grass to become a more favourable place for the ice formation? Discussing this question with a few of my colleagues, several different opinions were expressed, and I would like to share with the reader three of these explanations. Certainly I would be happy to hear of any idea that will point to the correct explanation. The first explanation which came into my mind was that the heat flow from the ground which flows regularly upward during night and compensates for the heat loss due to the radiative cooling of the surface, is not as efficient for the mown grass as compared with the nearby living grass. Hence, the mown grass cools faster and reaches

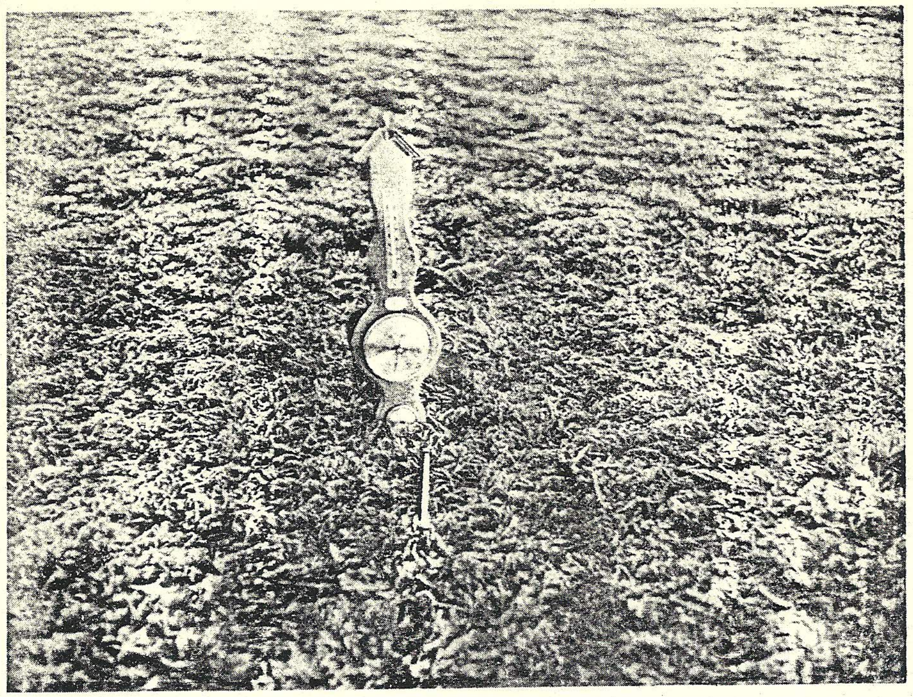

Fig. 1 Picture of the ice-stripes above the grass. One mercury thermometer is lying on the grass while the other in the centre of the picture is a part of the meteorological set of instruments

freezing point earlier, which explains the heavier ice layer above the dried grass. This sounds all right but what about the idea that the reduced heat capacity of the dried grass is responsible for the more efficient cooling of this grass. Another opinion is that these stripes having an arc shape, cool more efficiently because of the relatively larger area exposed to the atmosphere for infrared radiation losses.

Recently, I have closely observed three additional ice stripes cases in the same area which occurred on the three successive mornings of 3–5 March 1985. Although the mown grass was drier (about 10 days old) it was not as well organised into uniform stripes. But at each place where the mown grass was present, the ice layer appeared to be heavier. It should be emphasised that the total plant area exposed to the observer and to the air is much larger in living grass protruding from the surface, as compared with the grass lying in a densed form over the surface. This suggests a fourth explanation, as follows: The total ice-per-unit surface area might well be the same for the living and the mown grass. But for the living grass the ice forms mainly above the exterior part of the plant while leaving the warmer interior part with less ice. This causes living grass to appear much greener in comparison to the mown grass.

Fig. 2 presents the time series of the temperature observations between two of the ice-strips as measured by the thermometers shown in Fig. 1. It is interesting to note that while the temperature at the higher level i.e. 24cm, was constant at 4°C the grass temperature kept increasing for nearly half an hour. This is probably due to the quite stable stratification at that time. Only at 0725–0730 LST as the turbulence broke out at

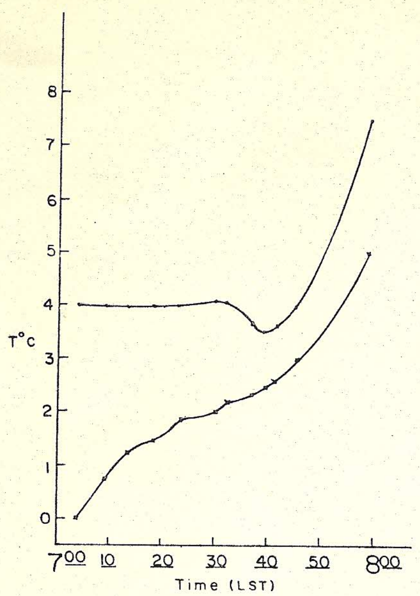

Fig. 2 Time series of the temperature observations between two of the ice-stripes

the upper level, the temperature started changing. First it increased a little and later dropped strongly to approach the increased temperature at the grass.

I hope this piece of information will help the reader to follow the ice-stripes occurrence and to suggest some evidence supporting any of the afore-mentioned theories, or perhaps to find another explanation.

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PINHAS ALPERT

WEATHER LOG STATION WATNALL – NOTTINGHAM WEATHER CENTRE*

The office at Watnall began life in 1941, as a Main Meteorological Office attached to a Royal Air Force Fighter Group Headquarters. Later an Air Traffic Control Centre was also established locally, increasing the responsibilities of the Meteorological Office. During the 1950s and 1960s there was a gradual increase in public service work and decrease in the RAF commitments, which finally ceased in 1967. Watnall was designated as the Public Service Office for the Midlands and East Anglia; during the 1970s it ceased to have responsibility for East Anglia but took on Lincolnshire, and was redesignated Nottingham Weather Centre in 1977.

The office is situated on a relatively open site some nine kilometres north-north-west of the centre of Nottingham. In February 1985 the office moved from hutted accommodation to new, larger offices which include a conference room as well as the usual administrative offices, Forecast Room and Communications Room. The accommodation is shared by the Met. Office Regional Maintenance Centre. Recent advances in technology mean that the office possesses a JASMIN display providing

*This article is one of a series aimed at providing background history and some extreme value statistics at *Weather Log* Stations (which, space reasons, cannot be routinely included in *Weather Log*)