Letters

Degrees of cold

In the late 1930s, it was my task to cycle a couple of miles each Saturday morning to do the week's shopping for the family, my mother preparing a list for me each time. With very few cars on the road, this was usually quite enjoyable, but I have very clear memories of occasions when the air temperature was below freezing . . . and very damp air at that, so that ice formed on my eyebrows and eyelids as I cycled along.

Those of us old enough to remember the Big Freeze of 1962/1963 cannot take the present, slightly chilly autumn weather seriously – why, the ground isn't frozen at all yet! Not only did the air temperature fail then to rise above 0 °C by day or night for several weeks, but one result of this was that the soil went into a state of permafrost, being frozen to a depth of about 2 ft. Not only did this make life particularly difficult for the stock farmer, who had to cart and distribute feed and water daily, after the not inconsiderable problems of starting the tractors, but had the humble earthworm not possessed such remarkable powers of recuperation, cereal farmers might well have had much worse problems to face later on.

By chance, our course of trainee pilots at No. 8 Flying Training School at Swinderby in Lincolnshire enjoyed the experience of completing the night flying exercises in these quite exceptional conditions. Luckily, there was no wind while the low temperatures lasted, and a very low sun had no effect on the frozen earth. With nothing to disturb the lower levels of the atmosphere the solids settled out, coating the town and countryside alike with a thin, grey, sooty layer. This left the air remarkably clear, and since we enjoyed a period of full moon during our night flying, we found it possible to map read in our cockpits without the benefit of any lighting. Not only that, but 'homing' toward base from the South one night, at about 20 000 ft, and glancing over the starboard side of the cockpit, I was treated to the sight of the shadow of our aircraft flitting over the ground. Of course, the brilliant moonlight and the clear air were largely responsible, but the contrast between the black shadow and the white, frozen countryside made this possible. It wasn't all entirely wonderful, however, far from it! 'Taxi-ing' from flight line to runway in safety was only made possible by an opening in the small side windscreens, the forward-facing screen being frosted over, and the fumes from the ethylene glycol demisting apparatus were not good for the health. The incoming air, with a very high wind-chill factor, blasted the exposed skin between helmet and oxygen mask and seared the eyeballs. This didn't last long however, and once the take-off was started, the cockpit heating rapidly took over!

No such compensation for a friend who was a farm manager at Sutton Hoo at the time. When two cattle strayed on to the thick ice on the river, they broke it, and while one merely went through up to the belly, the other, further out, went right through and, breathing in the gap between the water and the ice – and the tide ebbing, complained loudly. 'Well', said John, relating this tale, 'Being manager, I couldn't send anyone else in, so I took a rope to them.' The first, 'wasn't in too much trouble', but the second, being under the ice, meant that John also had to submerge and breathe in the air gap in order to take the rope to its neck. 'But John', I said, 'I'd have left the wretched thing to drown or freeze.' A slight pause then – 'Couldn't do that, so I told myself that the wind-chill factor made it warmer in the water.' To cap this tale of sheer, cold-blooded (well what else could it have been?) heroism, he found that the farmer, having arrived on the scene, had shared a bottle of Scotch whisky between the two cows, leaving none for him, so he had to walk back to the farmhouse with his clothes freezing as he went.

No, don't complain to me about the cold!

Richard Gregory
Woodbridge, Suffolk
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A halo on Mars

In a letter to *Weather* (March, 2007) Mr G. Watt questioned the fact that subsuns belong to the halos and hence my conclusion (Können, 2006) that the appearance of a subsun on pictures taken by the Mars Global Surveyor indicate that halos are present on that planet. Mr Watt suggests that the appearance of subsuns is caused by a reflection of sun-rays from the aircraft's window onto the clouds or, in case of Mars, by a reflection in the direction of the planet from the spacecraft's structure. In line with this argument, he proposed that if one could have viewed the same terrestrial or Martian scene without the presence of a spacecraft or aircraft, there would not have been a subsun.

The subsun explanation of Mr Watt does not fit the observations. In the classical (Meyer, 1929) as well as current (Greenler, 1980; Tape, 1994; Cowley, 2006) literature, the subsun is unequivocally attributed to reflection from horizontally oriented ice crystals, resulting in an uncoloured spot directly under the sun. Subsuns in other positions have never been reported, although in Watt's explanation the subsun could appear at any azimuth, depending on the angle of incidence of the sun's rays with the aircraft's window. Secondly, and in opposition to Watt's conjecture, there exist in the literature numerous reports of subsun sightings from balloons or mountains without any reflecting surface other than perhaps a photocamera. A list of early reports starting with the discovery observation of the subsun in 1850 by Barral and Bixio can be found in Meyer (1929). Nowadays, many pictures of subsuns taken in the open air are available from the Internet, good examples being those by Claudia Hinz (2006) and by Lukas Kosarek (Trncak, 2006).

My conclusion is that the arguments presented by Mr Watt do not provide a sufficiently strong basis to dismiss my interpretation of the Mars subsun in terms of halo scattering in the Martian atmosphere.

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G.P. Können
Soest, The Netherlands

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'Norwester' thunderstorm of Bengal

Paul Hunter's description of 'unusual roll cloud' in *Weather* (January, 2007, p. 27) is typical of a phenomenon that I observed in association with the classical 'Norwester' thunderstorm of Bengal during the Second World War. These are, in fact, 'gust fronts' – not the usual ones ahead of the storm but the product of the storm's down draught. This clearly spreads out all around the storm, being most powerful and destructive ahead of it. It was clear that these 'secondaries' could also be associated with the rear of the system, producing a well-defined local squall from the retreating storm centre. On several occasions this innocuous 'roll' quite suddenly could explode into a mini cumulonimbus, produce a few discharges and disperse! These were unpredictable 'secondary' storms – common in the Bengal region there but less so over the British Isles.

I know I have quoted here from the tropical thunderstorm realm but after some 60 years of watching these 'kings of the weather world' is it clear that their development is universal – even if their enthusiasm in performance is markedly different!

M.H.O. Hoddinott
Chester, Cheshire

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Failing snow ploughs 1947

The Derwent jet railway snowplough illustrated in *Weather* (March 2007, p. 61) was an extraordinary invention which did nothing more useful than to prove the great insulating properties of snow. Any Inuit sat cosily in his igloo could have advised the railway company that its project was misguided.

It was devised during the 1947 winter to try and clear the enormous snowdrifts on northern cross-Pennine rail routes, which had already defeated the traditional snowploughs – converted steam locomotive tenders with wedge shaped ends. However, the new design was even less effective against the drifts as the great amount of heat generated by the jet engines simply failed to melt the snow to any great extent. What it did do extremely effectively was blast away the ballast stones between the sleepers, as well as set fire to these creosote impregnated timbers, necessitating urgent track repairs in its wake! After a few unfortunate trials it was abandoned and scrapped, with British Railways reverting to the traditional snowploughs, which remain in use to the present day.

Reference

Booth G. 2007. Winter 1947 in the British Isles. *Weather* **62**: 61–68.

Andrew Overton
Doncaster, South Yorkshire

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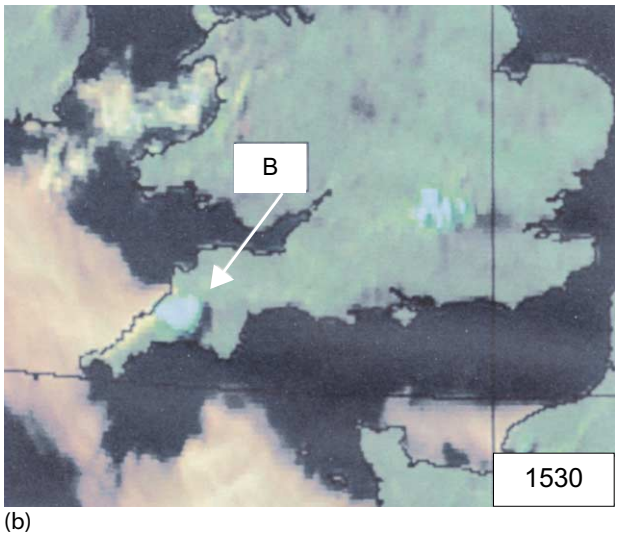
Erratum

Severe thunderstorms over southern England on 10 May 2006 – Martin V. Young.
Published in *Weather*, May 2007, pages 116–120.

We apologize for an error in figure 1(b) printed in this article. The correct figure 1(b) is as follows:



(b)

Figure 1. Meteosat 8 false colour images showing the development of thunderstorms across southern Britain on 10 May 2006. (b) 1530 UTC. Two of the visible channels (0.6 and 0.8 microns) and the near-infrared channel (1.6 microns which is sensitive to absorption by ice) have been combined to produce a single image. In general, turquoise clouds contain ice crystals, whilst white/mauve clouds are composed of water droplets (including fog). Vegetation creates a green signal and sandy areas are pink. (Source: EUMETSAT.)

An error occurred in the caption of figure 1 relating to the location colour key. The correct caption is as follows: Circles indicate locations of selected places mentioned in the text: yellow – Bristol, blue – Larkhill, pink – Reading and red – Swansea.

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