

Eclipse of the sun August 1999

A psychiatric perspective

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On Wednesday 11 August 1999 there will be a total eclipse of the sun. The path of totality will start at sunrise south of Nova Scotia and pass over the Atlantic toward the UK. It will then pass through northern France, central and southern Germany, Austria, the Middle East, Pakistan and India (Bell, 1997).

Over a period of around 75 minutes the sun will be increasingly obscured. Most parts of the UK are within the 80% zone but the area of totality (lasting up to two minutes) will only be visible from Cornwall, the Isles of Scilly and parts of south and west Devon and the northernmost parts of the Channel Islands (Smith, 1998). Multiple projected images of the sun may be seen through interlacing fingers or in the dappled sunlight beneath trees. A range of other unusual and spectacular phenomena both celestial and terrestrial have been described (Bell, 1997).

Although there was a total eclipse visible from the northernmost parts of the Shetland Islands in 1954 this is the first time in over 70 years that a solar eclipse will be visible from the mainland of the British Isles and will be the only opportunity until 2090 (Bell, 1997).

Local service issues

It is likely that the event will cause significant transport disruption particularly in the south-west of England because so many people will want to view this phenomenon. It is estimated that three million people visited the area of totality in June 1927. There were so many train movements that that day remains the busiest ever in the history of British railways (Smith, 1998). One local MP has called for government to create a 'Minister for the Eclipse', warning that parts of Devon and Cornwall face a 'tidal wave' of visitors for the event. Cornwall County Council have employed a County Planning Eclipse Co-ordinator who has compiled much useful information on a website (www.chycor.co.uk/general/solar-eclipse/index.htm).

The 11 August 1999 falls in the middle of the working week, the tourist season and the summer school and university holidays. Normally around

250 000 tourists would be in Cornwall alone in early August. The eclipse also coincides with other popular events like the Paignton Regatta. Modelling based on the capacity of the road system estimates that motor vehicles can bring about 200 000 new people in or out of the county each day. The highway working party estimate that the county road system can cope with a visitor population of about 750 000. However estimates for potential visitors to the area of totality are as high as six million.

Measures are being taken to restrict non-essential journeys especially by people staying on temporary campsites, the numbers of which are currently difficult to predict. The media have been predicting a huge influx of 'new age travellers'. Devon and Cornwall plan to have no road works between 30 July and 23 August 1999. Localised one way schemes may have to be set up in some areas to allow free flow of traffic and access by emergency services. It appears likely that there will still be significant disruption to road services due to congestion. Temporary accommodation at some workplaces is suggested for some services, out-patients and non-emergency hospital admissions have been postponed. Westcountry Ambulance has cancelled all staff holidays over the period and plan to use motorbikes for some paramedics. Air ambulance services may be the only way to transport casualties. The Ministry of Defence has been approached for additional support, particularly air transport. A greatly increased demand for emergency health services is likely and emergency psychiatric services will probably be no exception.

Solar retinopathy

The mythologies of a variety of cultures have associated solar eclipses with calamitous events (McCrickard, 1990). Socrates advised only to look at an eclipse via its reflection in water. Some eminent early astronomers were the victims of solar retinopathy, most notably Galileo. Cases of solar retinopathy reported in the literature since the eighteenth century have principally been related to the viewing of solar eclipses and each

subsequent eclipse produces a new series of cases (Yazzuni *et al.*, 1989).

The only time it is safe to look directly at the sun is during totality. At any other time the ultraviolet and infrared radiation will damage the retina, although no discomfort may be felt (Bell, 1997). This means that for the majority of observers in Britain there is no safe time to observe directly with eyes unprotected. Following exposure patients complain of decreased visual acuity and central scotomas. Histological examination of an eye following experimental intentional sun gazing (prior to enucleation for melanoma of the choroid) revealed damage particularly to the parafoveal rods. The relatively favourable prognosis of solar retinopathy is attributed to the comparative resistance of foveal cone cells to photochemical damage (Hope-Ross *et al.*, 1993).

In one eclipse in Israel a cohort of school children were affected after misdirection by a schoolteacher (Rothkoff *et al.*, 1978). Those in charge of vulnerable persons therefore need to be aware of the risks and manage them appropriately.

Psychiatric vulnerability

Individuals with psychiatric disorders (and learning disabilities) may already be at increased risk of retinal injury. Sun-gazing by psychiatric patients with a range of psychiatric illness has been the subject of concern in the past. Sun-gazing epidemics have been reported within psychiatric hospitals (Anaclerio & Wicker, 1970). Jaspers (1968) noted some patients with schizophrenia were able to 'sun-gaze' without apparent discomfort. Other authors have also noted this phenomena with schizophrenia (Kamp *et al.*, 1990) but also in paranoid psychosis in relation to *folie a deux* (Goldman *et al.*, 1992), in individuals with obsessional symptoms (Kobylski & Licamele, 1991) and in some types of 'neurotic' illness (Favazza, 1991).

There is a higher ocular morbidity in individuals with schizophrenia than the general population. This is thought to be related to high prevalence of smoking, substance misuse, poor general health and a variety of neuroleptic medications. Patients fail to report symptoms which may contribute to lack of appropriate treatment (Smith *et al.*, 1997). Sun-gazing may also play a role. Around 30% of patients with schizophrenia admitted to sun-glazing on enquiry with a specially designed questionnaire (Gerbaldo *et al.*, 1991). In separate studies one-third of patients with chronic schizophrenia show increased light tolerance (Gerbaldo & Thaker, 1991) and patients with schizophrenia with a history of sun-gazing show decreased retinal responsiveness under conditions of light

adaptation (Gerbaldo *et al.*, 1992). Dopamine acts as a retinal neuromodulator and may have a role in retinal response and photophilic behaviour in patients with schizophrenia (Gerbaldo & Thaker, 1991) although the effect of neuroleptics is still unclear.

Responsibilities of psychiatric services

It will be important to ensure that vulnerable patients with learning disabilities and psychiatric disorders are adequately protected. National Health Service trusts may have a duty to ensure the safety in particular of their in-patients during the event. The partial phases of the eclipse are always hazardous to watch directly. Even when 99% of the sun's surface is obscured the remaining crescent cannot be safely viewed without eye protection. It is likely that many individuals even outside the area of totality will still want to view the eclipse and this will include psychiatric in-patients. Staff and patient education prior to the event would seem sensible and developing policies to manage the patient group at the time of the eclipse will be essential. Directly viewing the partial phase in the knowledge of the dangers could be considered a form of deliberate self-harm requiring appropriate intervention.

Safe viewing techniques should be considered at in-patient facilities. Pinhole projection is the cheapest reliable technique using two pieces of cardboard but will require some expertise and supervision. A small pinhole is made in one card and the image is projected approximately two feet behind it on the other. A telescope or binoculars can also be used as a lens projecting onto a screen, but care must be taken not to look through them directly at the sun. A variety of materials are being marketed for hand held devices or spectacles. These are described as resin, aluminised mylar and black polymer (Smith, 1998). All such devices must be certified under the provisions of Personal Protective Equipment (European Community Directive) Regulations 1992 for the UK and Council Directive 89/686/EEC for the European Union and carry a CE kite mark (Bell, 1997). Spectacles can be obtained wholesale by hospitals at less than 60 pence each (including VAT) in lots of one hundred. It would appear an inexpensive preventative measure in relation to the potential costs of retinal injury.

Conclusion

The 1999 eclipse will be a unique event in the lifetime of many people in Britain. Psychiatry will not be unaffected. Modest preparation should make the experience both safe and enjoyable.

The eclipse is certain, the weather however will be more difficult to predict.

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