Prehistoric ecology from pollen record

SIR—A "settlement gap" implied by the Weser estuary pollen records circa AD 500–700 does not pose "a fresh problem"[1], rather it supports an old conclusion. This is a protohistoric period significantly called the Migration Period (*Völkerwanderungszeit*) and virtually every settlement and cemetery in the western half of the Weser–Elbe "triangle" was abandoned in the first half of the fifth century, while those in the eastern half continued into the sixth century[2]. Mass emigration brought many of these people, who called themselves Saxons, to eastern and southern Britain. The artefacts buried in their new settlement and cemeteries here link directly back to the Weser–Elbe homeland.

There is no need to invoke plagues or other sudden catastrophes, for a steadily rising sea level left the coastal marshland settlements on their *Wurten*, for example Feddersen Wierde[3], without sufficient agricultural land and the inland settlements on the *Geest*, for example Flögeln[4], appear to have reached a point of marginal returns from their over-cultivated soils. The Venerable Bede summarized the historical basis for all this in the eighth century AD in Book I Chapter 15 of his *Ecclesiastical History of the English Peoples* and both archaeology and the environmental sciences appear to confirm his account.

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1. Moore, P.D. *Nature* **319**, 361–362 (1986).
2. Böhme, H.W. in *Führer zu vor-und frühgeschichtlichen Denkmälern* 29: *Das Elb-Weser-Dreieck*, pt.1, 205–225 (Philipp von Zabern, Mainz, 1976) esp. map on p. 223.
3. Schmid, P. in *Lowland Iron Age Communities in Europe* (eds Cunliffe, B. & Rowley, T.) 123 – 145 (Oxford, 1978).
4. Zimmerman, W.H. in *Lowland Iron Age Communities in Europe* (eds Cunliffe, B. & Rowley, T.) 147 – 163 (Oxford, 1978).

Nuclear risks

SIR—After reading your leading article (*Nature* **320**, 384; 1986), the persecuted employees of the nuclear power business must wonder what they have to do to satisfy journalists and broadcasters. As I understand it, their industrial accident record, both in respect of injuries to their own operators and to the public at large, is among the best in either the fuel industries or the chemical industries, to which their activities have perhaps the closest similarity. What can you mean therefore by your reference to the "poor safety record of Sellafield"?

As to the supposed poor public relations activities, I am not sure that you and the press generally give them much attention. What can your victims do in the face of a persistent campaign based upon the supposed occurrence of dangerous accidents for which there appears to be no evidence, when that same lack of evidence is the basis for claims of secrecy and "cover-ups".

Is it not clear that the employee of the nuclear power business is, while at work, far less liable to accident or death than you are at the wheel of your car? Indeed, are not members of the public more at risk from you at the wheel of your car than they are from the nuclear power business? Drivers kill about 5,000 people each year in the United Kingdom, whereas handling radioactive products for nuclear fuels appears to kill nobody (not even, I believe, the shellfish living comfortably by that waste water outlet from Sellafield into the Irish Sea).

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• The article complained of was intended to be ironical, as should have been apparent from the last sentence — Editor, *Nature*.

Sexist ads

SIR—I would like to protest at a number of recent advertisements that have appeared in *Nature* depicting members of the male sex as colourless white-coated individuals. Surely you must realize that many of your readers are men and take exception to this unfair treatment, especially when, in the same issue, several women are illustrated wearing fashionable clothing, doing interesting things like swimming and looking as if they are having a good time?

I am afraid I shall have to cancel my subscription forthwith.

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Velikovsky's evidence?

SIR—Your more perceptive readers may have been surprised to read in C. Leroy Ellenberger's letter (*Nature* **318**, 204; 1985) the statement, attributed to me, that "if a formerly very bright comet periodically altered the sky's brightness, then the dates of appearances and disappearances for Venus would be affected". Venus is such a brilliant object that variations in the brightness of the sky would make little difference to its setting and rising dates. "The debris from the disintegration of comet Encke 4700 years ago" might, of course, act indirectly by filling the stratosphere with enough dust to prevent Venus being seen near the horizon line. This would produce longer invisibility periods; but only in one year, or perhaps two separated by an interval corresponding to the period of the comet. It would not explain all the anomalies of the Venus Tablets.

With regard to the Velikovsky theory, archaeological evidence from Babylonian clay tablets has not verified the "Comet Venus" identification; but a large comet other than Venus, as deduced by Clube and Napier in their "Cosmic Serpent", is a possibility.

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Plasma — the fourth state of matter?

SIR—J.N. Goldschvartz (*Nature* **320**, 302; 1986) basically asks "what is the fourth state of matter?". There is no debate about the first three phases of matter[1] — solid, liquid and gas. When a solid is heated, a liquid is formed, and when a liquid is heated it is transformed into a gas; a commonplace example is the progression from ice to water to steam.

When a gas is heated, that is, when additional energy is provided to the atoms or molecules, some of the electrically neutral particles can be split into electrons and positive ions. Such an electrically charged gas, a partially ionized gas, which overall is electrically neutral, is termed a plasma if it exhibits "collective" (jelly-like) behaviour[2] due to the long-range (on an atomic scale) electromagnetic forces acting between the charged particles.

Clemmow and Dougherty[3] say on page 1 that "the state in which there is an appreciable degree of ionization has indeed been called the fourth state of matter". Surely plasma should, unequivocally, be termed the fourth state of matter.

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1. Walton, A.J. *Three Phases of Matter* (McGraw-Hill, Maidenhead, UK, 1976).
2. Chen, F.F. *Introduction to Plasma Physics* (Plenum, New York, 1974).
3. Clemmow, P.C. & Dougherty, J.P. *Electrodynamics of Particles and Plasmas* (Addison-Wesley, London, 1969).

South Africa

SIR—In suggesting that South African scientists be required to sign a statement of political beliefs before their articles are considered by international journals or they themselves be allowed to attend overseas conferences (*Nature* **320**, 486; 1986), Masters, Caithness and Rayner respect neither science nor scientists. The quality of a work of science exists entirely within the work. Other requirements for publication or conference-attending are inherently corrupt and corrupting. And a man's political beliefs are nobody else's business unless he is a politician.

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