the help of a decision tree. The likelihood of the failure of a reactor component or safety system is assessed and its consequences on other components or subsystems are estimated. These results in their turn are inputs for a chain of calculations leading to probabilistic risk assessment used by the reactor designers. Since the number of vulnerable components is rather high, this procedure cannot be rigorous. Our view is that this method should be replaced by risk assessment using the observed data.

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^{131}I in ruminant thyroids after nuclear releases

SIR—The substantial yield of ^{131}I from nuclear fission, its energetic β and γ emission and its concentration in the thyroid gland have led to the recognition of this nuclide as a significant nuclear hazard[1-3]. In the late 1950s the Medical Research Council funded a study of ^{131}I accumulation in the thyroid glands of sheep from fallout arising from nuclear weapons tests. This study was in progress during the accident at Windscale in October 1957 and during the Northern Hemisphere weapons testing of October–December 1958 in which 29 (17 Soviet and 12 American) weapons were detonated[4]. British weapons at that time were detonated in the Southern Hemisphere, having little effect on fallout in the United Kingdom[2].

It was therefore of interest to measure ^{131}I accumulation in sheep thyroid glands following pasture contamination with fallout from the Chernobyl reactor, to obtain a comparison with the earlier measurements. Thyroid glands were collected from fatstock from 20 May to 17 June. At this time sheep were at pasture and hence directly ingesting any nuclides on the grass. Because of the late spring, fat cattle were generally not at pasture at the time of maximum contamination, on 2 May[5].

Figure 1 shows thyroid ^{131}I radioactivity from sheep grazing in Scotland during the autumn of 1958[4] and in East Anglia during the spring of 1986. It can be seen that thyroid radioactivity following the Chernobyl accident was marginally higher than that resulting from the nuclear weapons testing during the autmun of 1958. By contrast, the highest sheep thyroid ^{131}I measured in the maximum deposition area near Windscale 31 days after the reactor accident was 7.4×10^4 Bq g^{-1}, 300 times higher than the radioactivity measured after Chernobyl. In the sheep thyroid glands recently measured, the radioactivity had a half-life on storage of 8.05 days, showing that ^{131}I alone was present. Comparison of radioactivities on different dates of collection showed a biological half-life of about 6 days.

Cattle thyroid glands are less useful than those of sheep for monitoring fallout, because of the widespread practice of feeding beef cattle indoors on stored fodder for much of the year. Thyroid ^{131}I in stall-fed sheep following a period of radioactive fallout from nuclear weapons testing by the United States showed only 0.7% of the radioactivity in grazing sheep[4]; a limited number of human thyroids also showed ~ 1% of the radioactivity of sheep[4]. Five cattle thyroids collected recently in East Anglia showed a mean of 0.97 ± 0.13 Bq g^{-1}, compared with 99 ± 5 Bq g^{-1} for sheep killed the same day. One other cow, however, had 61.7 Bq g^{-1} ^{131}I, which must have resulted from grazing on contaminated pasture.

Data already published[5] showed human thyroid radioactivities after Chernobyl of 2–33 Bq, the highest concentration being ~7 Bq g^{-1}, in a child, while adults showed a maximum radioactivity of 1.7 Bq g^{-1}. Sheep thyroid radioactivity on the same date measured 243 ± 48 Bq g^{-1} ($n=15$), with a range of 39–703 Bq g^{-1}.

^{131}I from a reactor accident is capable of contaminating pasture for a considerable distance downwind. Most human ingestion of ^{131}I derived from fallout comes through milk, as the mammary gland effectively concentrates dietary iodine into milk[6]. To minimize the human ingestion of ^{131}I, a reasonable precaution would be to feed dairy cattle stored fodder while pastures are measurably contaminated.

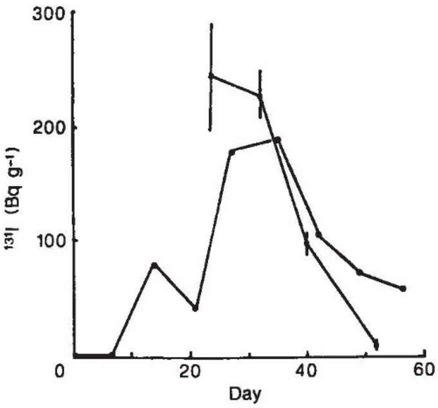

Fig. 1 Sheep thyroid radioactivity following the reactor accident at Chernobyl (|) and the nuclear weapons testing of the autumn of 1958 (●). Day 0 has been taken as the day of the Chernobyl accident (26 April 1986) or the peak of nuclear weapons testing (3 November 1958). ^{131}I activity is given in Bq g^{-1} wet weight of gland (± standard error of mean).

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Fault striations slip from sight?

SIR—Communication of ideas begins with agreement on the meaning of terms. Unfortunately, in discussions on mesofaults and their surface textures, terms are endowed with different meanings with alarming ease thus giving rise to considerable confusion. A glaring example is the term 'slickenside'.

Linear structures on fault planes (grooves or fibrous grains) represent the orientation of the relative displacement between adjacent fault blocks. Recently many techniques have been developed to determine from slip orientation data the attitude and relative magnitudes of the principal stresses responsible for the deformation. Such data are of paramount importance in the study of neotectonics relating recent plate motions to deformation within continents. The problem is that some authors[1,2] use slickenside to refer to planar structures whereas others[3] use it to describe a lineation.

Etymologically slickenside means smooth plane, which is how it was first defined in 1822. Surely this should remain as the agreed meaning. The associated linear structures are best termed striations; qualifying words, such as fibre and scratch, are adequate to distinguish accretionary crystal growths from abrasion structures[4].

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