microscope using the rather high electron flux rates required for high resolution. Undoubtedly, there must exist fiendishly high electric field gradients on a highly local level caused by electron–atom collision–induced ionization, and they might be responsible for some positional instabilities of the atoms.

However, one should also consider the effect these charges in the specimen might have on the trajectories of subsequent incoming electrons. They would most certainly distort the optics on a local level. Furthermore, as the charges build up and dissipate — by whatever mechanism(s) — the fluctuating local electric fields cause fluctuating local distortions in the microscope's optics (A.P.K. *Ultramicroscopy* 7, 351–370; 1982). The net result would be somewhat like looking at a photograph lying (face up) on the bottom of a pool of water whose surface is inundated by random ripples. Is it the painting that is undergoing 'convulsions', or is it just its image?

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HOWIE REPLIES—Specimen charging effects certainly can disrupt the imaging process in the electron microscope, giving rise for example to sudden and large image displacements. It seems unlikely, however, that this can account for the majority of the observed apparent changes of structure, particularly changes from single crystal to multiple twin and back again.

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Legal problems of Huntington's chorea tests

SIR—Recent correspondence on the ethics of using a recombinant DNA probe to diagnose Huntington's chorea has not mentioned counsellors' potential legal obligation to provide such a test, regardless of their personal ethical judgement. That the G8 probe does not provide accurate diagnosis is irrelevant here, as all medical diagnoses provide only evidence for disease states, not proof of them. An established genetic screen, fetal karyotyping to detect Downs syndrome, can give good evidence that a fetus is normal, but can also give false negatives for a mosaic fetus[1] or for one carrying a Downs-causing translocation[2], as well as through sampling or laboratory errors. Counselling about the test for at-risk mothers includes mention of these risks, as will analagous counselling for the G8 probe[3].

The expectation that mothers over 35 years old will receive fetal karyotyping, with attendant counselling, has recently acquired a legal standing, with the award of £35,000 damages to Mrs Ayten Yagiz, who sued the City and Hackney Health Authority after giving birth to a Downs syndrome daughter when she claimed not to have been offered fetal karyotyping[4]. This would appear to establish a precedent for saying that doctors have a legal liability to provide established genetic tests for at-risk mothers. At 40 years old, Mrs Yagiz daughter's risk of Downs was ≃1% (ref. 5), far less than that facing most parents seeking counselling for Huntington's chorea, cystic fibrosis or other inherited diseases for which cloned probes are becoming available. Other analagous cases are currently awaiting trial. Once cloned probes join fetal karyotyping as an established genetic screen, genetic counsellors may find they have an obligation to use them beyond their present research facilities' ability to do so. This may be a constraint on putting such probes into clinical use.

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Is cannibalism all in the mind?

SIR—Behrensmeyer *et al.* show that trampling of bones in sand can produce marks mimicking cutmarks made by flake tools. They comment that the evidence for meat-eating among early hominids is called into question by this finding.

Putative cutmarks on human bones found at various historical sites, notably at Knossos[2], have been used to advance the hypothesis that cannibalism was practised in these cultures. The finding of Behrensmeyer *et al.* raises the possibility that this hypothesis, too, is unfounded and strengthens Arens'[3] contention that apparent evidence for ritual human cannibalism is in fact a psychological phenomenon of anthropologists rather than a dietary phenomenon of 'barbaric' civilizations.

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Linkage between the nation states

SIR—The 'self-thinning' rule of plant ecology[1,2] states that as communities of plants mature, increases in the mean mass per individual plant (W) tend to be accompanied by decreases in the number of plants per unit area (N), and in particular that

$$\log W = A + B \log N$$

where A and B are constants. If B took the value -1 then decreases in N due to self-thinning would be exactly matched by increases in W and the mass of standing crop per unit area ($= W.N$) would be constant ($= A$). In practice[3,4], B tends to take values close to $-3/2$, so that

$$\log W = A - 3/2 \log N$$

Hence

$$\log W = 3 \log(W.N) - 2A$$

and the standing crop increases with W. Denness[5] suggests that the '$-3/2$ rule' applies to the distribution of size and density between the states of Europe; and hence he argues that if the total population is to expand the number of nation states in a given area must decrease. The evidence rests on a log–log graph in which W was equated with nation size (population) and N with 1/(national area) (that is, with number of nations per unit area)[6]. The graph resembled a scatter plot, but the addition of a grid of lines of slope $-3/2$ yielded some apparently meaningful associations between nations[6]. I suggest that any resemblance with the '$-3/2$ rule' of plant ecology is fortuitous.
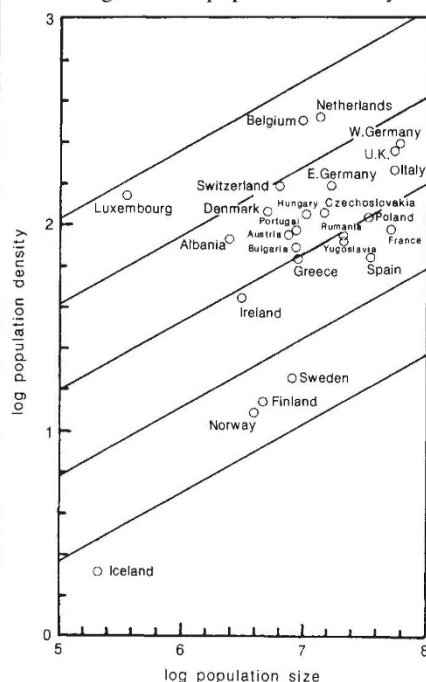
The figures for population density of

Fig. 1 A plot of $\log_{10}$ population density (people per km^2) against $\log_{10}$ population size (people per nation). The added lines have a slope 1/3.