rence of abortion in the laboratory under relatively undisturbed and otherwise normal breeding conditions makes the occurrence in the wild at least plausible. Stable social relationships, as demonstrated by the family structure of *Microtus arvalis* (*13*), if disrupted, could lead to pregnancy termination in natural populations. Likewise, excessive immigration into resident populations could lead to increased occurrence of pregnancy termination. A continuously disrupted, shifting population probably would produce very few juveniles although the incidence of breeding and early stages of pregnancy might remain high. Thus, the establishment and maintenance of stable social and spatial relationships within a population of voles would be an important influence on birthrate. The implications of these findings relative to demographic change and gene flow in microtine populations remain to be investigated.

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Josephson Junction Detectors: Geophysical Applications

In his review article on Josephson junction detectors (*1*), Clarke comments that the high magnetic field sensitivity of superconducting magnetometers utilizing flux transformers "is of limited use in an unshielded environment because of the noise in the earth's field." With these words the author dismisses, unsuspectingly I am sure, a large branch of geophysics in which this "noise" is of great interest and is studied intensively. In fact, Josephson junction devices are now being used to study fluctuations in the geomagnetic field and there is no doubt that the high sensitivity of the devices can be used to make unique measurements, particularly at frequencies near 5 hertz (*2*).

Even when the high magnetic field sensitivity of the Josephson junction magnetometers is unneeded, their other advantages over conventional systems for geomagnetic field measurement can make their use desirable. These advantages include a flat frequency response from very nearly zero frequency (d-c) up to frequencies in the kilohertz range, compactness (in some applications), and simple shielding of the sensors from external signals.

In addition to making possible studies of the fluctuations in the geomagnetic field, which provide information about the properties of the ionosphere and magnetosphere, Josephson junction magnetometers are also likely to play an important role in rock magnetism measurements (that is, in studies of continental drift) (*3*), in magnetotelluric work (which provides information about the structure of the earth's crust and upper mantle), and in communication systems with receivers that are deeply submerged in the sea (*4*). Two other geophysical applications are discussed by Clarke (*1*). Thus, I would further contest his statement that Josephson junction magnetic field gradiometers are "of far greater practical importance" than the magnetometers.

I do not intend my comments to detract from Clarke's interesting and timely review. Instead, I hope they will further illustrate the diverse and far-reaching application of Josephson junction detectors.

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Fraser-Smith's criticism is, I feel, a fair one. I was trying to make the point that, although a substantial improvement in magnetic field sensitivity can be made with the aid of a flux transformer, this *improvement* is of limited use in an unshielded environment. I share Fraser-Smith's enthusiasm for the use of Josephson junction magnetometers in geophysics.

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