theta waves are largely absent from the MEG of Fig. 2B; they were also absent from MEG's (not shown here) taken at several other points around the head during the same sitting. At this time, without extensive EEG and MEG data taken from this subject, one can only speculate on the reason for this absence. Perhaps these theta waves are an example of the case, mentioned earlier, where there is an EEG voltage but no currents. On the other hand, there may be nonzero theta currents, but they would be symmetrically distributed to give a canceled, zero external magnetic field. Such symmetrical currents can be produced, for example, by one or more dipole generators near the surface, each oriented with its axis perpendicular to the surface; in general, magnetic detection of the zero magnetic field from symmetrical currents does not yield new internal information since the symmetry can be found from exact EEG measurements. Whatever the reason for the absence of the theta waves from the MEG, Fig. 2B suggests that the MEG can be substantially different from the EEG.

During the sitting in which Fig. 2B was recorded, a preliminary search was made for d-c in the brain before and during hyperventilation. There is some basis (*1*) for believing that d-c changes may accompany the delta waves, at about the same level, yielding an external d-c field of about 5×10^{-8} gauss. The technique for the d-c search (*8*) consisted of looking for baseline shifts of the MEG while moving the subject's head up to and away from the detector; the lower bandwidth limit of the MEG had been set at d-c. No d-c magnetic field was detected to within the sensitivity of this measurement, which was somewhat less than 2×10^{-8} gauss. It is too early to interpret the apparent absence of d-c fields in this case.

I believe the high-sensitivity detection system used here shows promise both as a clinical and as a research tool for studying the brain.

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References and Notes

1. Steady (d-c) voltages generated in the brain are usually measured by surgical placement of electrodes directly on the brain of experimental animals. See H. Caspers and E. Speckmann, *in Basic Mechanism of the Epilepsies*, H. H. Jasper, A. A. Ward, A. Pope, Eds. (Little, Brown, Boston, 1969).
2. A simple, idealized example is a spherical shell consisting of two conducting hemispherical shells separated by a thin, circular band of insulator. A battery is placed inside with each terminal connected to a hemisphere, along with a resistor and switch across the terminals so that a current flows through the resistor when the switch is closed. A voltage measurement on the surface will give the voltage difference of the hemispheres without giving information on the current flow through the resistor; magnetic measurement will, however, show whether the switch is open or closed.
3. A simple, idealized example is a conducting sphere, say of salt water, with an internal ring concentric with the sphere consisting of a continuous distribution of generators closed on themselves so that a current flows in the ring. There will be no potential difference between any points on the surface but there will be an external magnetic field as a result of the ring current.
4. G. M. Baule and R. McFee, *Amer. Heart J.* **66**, 95 (1963).
5. D. Cohen, *Science* **156**, 652 (1967).
6. ———, *ibid.* **161**, 784 (1968).
7. ———, E. A. Edelsack, J. E. Zimmerman, *Appl. Phys. Lett.* **16**, 278 (1970).
8. D. Cohen, J. C. Norman, F. Molokhia, W. Hood, Jr., *Science* **172**, 1329 (1971).
9. The SQUID section of the magnetometer is based on the Josephson effect; the point-contact type of SQUID used in these experiments is described by J. E. Zimmerman, P. Thiene, J. T. Harding [*J. Appl. Phys.* **41**, 1572 (1970)]. It is believed by Zimmerman that the noise of this magnetometer can be reduced well below 1×10^{-10} gauss (r.m.s., per root cycle) before any hard, natural low-noise limit might be reached.
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Behavior of B-Chromosomes in Xanthisma texanum DC.: A Nonrandom Phenomenon

Xanthisma texanum DC. (Compositae) is a diploid plant in which $n = 4_{II}$ with zero to four small supernumerary chromosomes (B-type). As in *Claytonia virginica* (Portulacaceae), the number varies within the individual but that variation is not random (*1*). Recent discussion of the phenomenon in *Claytonia*, a tetraploid, centered on genetic control of supernumerary chromosome distribution within individuals (*2*). Parnell argued that Lewis had not fully considered polyploidy as an explanation for the multiple genome phenomenon.

True roots lose B-chromosomes in embryogenesis, although rarely they may persist in low numbers in seedlings (*3*). Such behavior has been observed consistently in more than 75 plants. On the other hand, adventitious roots from cuttings may retain B-chromosomes in low numbers, even after 5 months of growth. In one plant $2n = 9$ was the most common number found in emergent adventitious roots and in some adventitious roots of the same plant after the roots had grown several decimeters. Clearly there is some controlled difference with respect to genome of true root tissue and stem tissue which has differentiated into root tissue.

Behavior of B-chromosomes in meiosis is consistent with time. Thirty-six buds taken from one plant over the space of 8 months were examined. Among 1,073 pollen mother cells, 1,019 had 5_{II}, eight had four $A_{II} + 2 B_{I}$, 15 had nondisjunction of the B_{II} at A1 or of the B chromatids at A2, three had 4_{II}, five had $4_{II} + 1B_{I}$, two had 6_{II} and the remaining were A-chromosome abnormalities. There were many micronuclei in adjacent tapetal tissue, which indicated loss of B-chromosomes. There was no correlation between time of flowering and percentage of abnormal behavior of B-chromosomes.

In a single floret of another plant 322 pollen mother cells had 5_{II}, two had precociously dividing B-chromosomes and two ontogenetically related cells had 4_{II} and 6_{II} each.

Because behavior of B-chromosomes is so consistent within single thecae and often among whole anthers and florets and even buds from the same plant, control of B-chromosomes in a diploid, such as *Xanthisma* with multiple genomes, is clearly indicated.

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