metry formula is acceptable (*3*). Incidentally, it should be noted that the use of the allometry formula does not commit one to Dubois' rationale. As I stated in my paper, ". . . it provides a satisfactory *empirical* description of brain weight and body weight relationships for the mammals as a class."

Count's other criticisms seem to arise from his feeling that his "mathematical formulation" adequately accounts for mammalian data, and that I introduced unnecessary assumptions in my analysis. A brief reply to this point is impossible. I can state, first, that Count's analysis depends on the introduction of a second-order equation in log P and three constants, k_1, k_2, and k_3, without any attempt to justify the form of the equation or to suggest the biological significance of the constants. Occam's razor demands that "entities must not be multiplied beyond necessity" (*4*), and the terms of an equation are entities whether or not they are assigned physical referents. The fact that Count's "mathematical formulation" was not given a biological rationale is not an argument in its favor in terms of criteria of parsimony. A more detailed critique of Count's formulation has been presented by Sholl (*5*).

As for my assumptions and resulting analysis, the allometry formula, although it is presented in my paper as an empirical equation, can, in its general form be derived from simple assumptions. Dubois' error was less in his rationale for using the general equation than in his technique for determining a value for the exponent. A complete presentation of the argument would be out of place here, but Sholl's paper (*5*) covers some of the necessary ground.

My assumption that part of the brain weight is a function of intelligence and is evolved independently of the evolution of body weight is another way of stating the rather common notion that a given level of intelligence for a species is related to a given amount of brain. (I did not raise the problem of individual differences within a species.) At no point did I suggest that the primates are unique in developing this part of the brain weight. I specifically assigned the development to the mammals as a class and used the contemporary opossum as a species that represents the hypothesized primitive mammalian condition in which the entire brain weight is related to the body weight by the allometry formula. One of the advantages of my approach was, in fact, that the resulting equation presents a "common mathematical pattern" for mammals that made sense of primate data. Furthermore, human data were also subsumed under this pattern. And finally, the order of intelligence derived for macaques, baboons, and the orang on the basis of delayed reaction tests (*6*) follows the same order as that derived in my paper. These considerations show, I think, that my biological speculations were adequately seizable.

HARRY J. JERISON
Hyde Road, Yellow Springs, Ohio

References and Notes

1. K. S. Lashley, *Quart. Rev. Biol.* **24**, 28 (1949).
2. H. J. Jerison, *Science* **121**, 447 (1955).
3. G. v. Bonin, *J. Gen. Psychol.* **16**, 379 (1937).
4. E. Newbury, *Psychol. Bull.* **51**, 70 (1954).
5. D. Sholl, *Proc. Roy. Soc. London* **B135**, 243 (1948).
6. H. F. Harlow, H. Uehling, A. H. Maslow, *J. Comp. Psychol.* **13**, 313 (1932). This reference was pointed out to me by Donald R. Meyer after my paper was published.

19 July 1955

Seasoning for the Calendar

The World Calendar would be assured of adoption if the United States would favor it. The postponement of its approval gives us a chance to include season balance in our new calendar.

Why does the winter solstice occur about 10 days before the end of the calendar year? The early Latins could start each 304-day calendar year with the same annual natural phenomenon, because they did not count winter days. After January and February were added to the old 10-month calendar, the 355-day Numa Calendar rapidly got out of phase with the natural year, because every day was counted. In the time of Julius Caesar it was a quarter of a year ahead. Intending to restore the year's ending to the winter solstice, Caesar added 90 days to 46 B.C., making it a season adjustment year 445 days long, which ran 5 days past the winter solstice. He never got around to correcting the error. In 45 B.C. he established a calendar of 365¼ days. By the 16th century A.D. the Julian Calendar was ending 20 days after the winter solstice, owing to its simple leap-year rule. Pope Gregory took 10 numbers out of October in 1582, making a partial adjustment year of 355 days, leaving 31 December still 10 days past the winter solstice. Gregory's refinement of the leap-year rule causes our present civil year to equal almost exactly the true length of the solar year and immobilizes the year's end at a meaningless time 10 days after the solstice.

If having the new calendar begin the day on or after the meaningful moment of some annual phenomenon would enhance its chances of approval, we should promote the idea. If Caesar and Gregory could declare adjustment years during times when changes were rare, why cannot we, who are experiencing many changes, declare another adjustment year and complete the return of 31 December to the solstice?

While we continue under the Gregorian Calendar with its date numbers progressing through the days of the week, we can choose for season adjustment a year in which a skip of 10 numbers will place 31 December of that same year on a Saturday; 1957 will be such a year; 1963 will be another such year. In 1957 (or 1963) 12 October followed by 23 October will put 31 December on a Saturday. Under the stabilized World Calendar *every* year will begin on a Sunday, and we can never omit 10 numbers without either forcing 1 January away from Sunday or breaking the cycle of the days of the week.

The persons who are the most influential in sponsoring the World Calendar fail to see the difference between absolute time and a man-made instrument for keeping track of time. They ask, "When and where will these lost days be reinstated?" Our reply can be, "When and where did we reinstate the days 'lost' by Gregory?" By deleting 10 calendar numbers during only one specified year, we shall not be deprived of days or bring the solstice any sooner; we shall merely leave out number labels on a time chart and give the calendar a different reading for the day the solstice arrives. If one's income for the 355-day adjustment year will be less, one's grocery bill will be less, also. A bank loan due 15 November 1957 will be due 25 November instead.

In revising our calendar, must we let a 2000-year old error and a 400-year old "fixation" prevent us from matching the calendar quarters with the four seasons? *Before* we adopt a static calendar, let us first synchronize our civil year with the solar year. Worldsday, the intercalated, unnumbered day between calendars, can be Solstice Day to boot. The first day of each quarter can be the first day of a season.

JOHN J. CASE
409 Westwood Avenue, Kingsford, Michigan

1 August 1955

Every great advance in science has issued from a new audacity of imagination.—JOHN DEWEY.