mittee's report was directed at the need for the University of California's Biohazards Committee to go beyond the letter, while retaining the spirit, of the National Institutes of Health (NIH) guidelines in its surveillance of recombinant DNA research on the university's San Diego campus.

The San Diego committee's report was accepted by the city council in late March 1977. Since then the concern within the scientific community about the real and potential hazards of the research has lessened, particularly with respect to the use of the K-12 strain of *Escherichia coli*, as reported in Philip H. Abelson's editorial (19 Aug., p. 721).

Regardless of the outcome of the current debate on the regulation of recombinant DNA research, I fear that, with the increasing evidence that the research poses less danger than had been believed by its critics, the need for improved laboratory safety may be disregarded. One of the conclusions reached by the San Diego committee is that laboratory design and practices in general are not always consistent with the level of risk to which investigators, students, technicians, and others are exposed. Concern about complying with the NIH guidelines has at least drawn attention to situations in which research institutions are poorly prepared to deal with the emergencies posed by laboratory accidents. Another result of the open debate on recombinant DNA research is the increased public awareness of science and its role in society. In the long run that too can be beneficial.

If the current heightened awareness of the problem of laboratory safety is diminished by reduced anxiety about the dangers of recombinant DNA research, at least one of the tangible benefits of the controversy may be lost. Such a development would be tragic from the point of view of everyone's best interest.

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Augmentation Trends

A hypothesis is always more interesting when accompanied by a test. I demonstrate here that the windedness index of M. O'Hare (Letters, 1 July, p. 6) gives an even stronger lengthening trend for writings in *Science* than I envisioned.

Before presenting the data, though, I wish to explain [see letter from R. J. Huxtable (15 July, p. 208)] that my original letter (10 June, p. 1154) was not intended as an attack on novelists as well as science news writers. Novelists and poets experiment with form as well as content and I do not want to impinge on their game. Consequently, I take as gratuitous the apparent support for my thesis provided by the Faulkner example of Huxtable. I should add, however, that I do not wish to annoy only news writers in scientific journals; I address all science writers and, in particular, all *Science* writers. Incidentally, the symptoms described by Huxtable, who falls asleep reading Boswell, may be due to periodomonotony (although Boswell's sentences are atrociously long, and there may be interaction). The onset of this curious clinical entity is manifested by slow eyelid lowering and saltatory head and body movements (in severe cases, injuries from falling out of a chair have occurred), apparently induced by an overregular repartition of typographical signs in a text. Writers can aid in eradicating this malady by avoiding uniform sentence length. Effective antidotes are LP's [long-windedness profiles (see my letter, 10 June)] having a skewed normal distribution (increased frequencies at shorter lengths) and a mean below 25 words per sentence. For a more radical treatment Huxtable might try reading G. Garcia Marquez, who writes without paragraphs or periods, although some commas remain (caveat: his novels are not placebos and may provoke sleeplessness).

As the French observe at railroad crossings, "*Un train peut en cacher un autre.*" Similarly, one trend can hide another. I am not ready to say what the fundamental trend is, but its expression in *Science* seems to involve *both* sentence length and report length. Thus, I now extend my demonstration to authors of reports. (I have also made compatible observations over the same period of articles and news items, but I do not describe them here because of a self-imposed length limit for this letter.) My sample is the first issue of *Science* in July of each year, from 1 July 1955, when the modern three-column design was adopted, through 1 July 1977. For each issue, I have measured the number of pages (P) and reports (R) in the Reports section. The results are shown in Table 1.

A plot shows that evolution of the ratio P/R approaches a straight line. As with many evolutionary processes, it is hard to believe this came about without design. Some workers may feel this trend has been established by the ran-

dom accumulation of neutral changes in publishing and editorial policy, author behavior, and so forth. I find this notion distasteful. Length (in pages or words) of present *Science* reports is roughly triple that of a generation ago! By contrast, the human brain took several million years to triple in volume. The P/R growth rate is even greater than that of the earth's population. It also exceeds that for world military spending, which in the 20-year period 1957 through 1976 went up from $155 billion to $280 billion (or only 80 percent), on a constant dollar basis (*1*). Therefore, a cause should be sought for this drift, which cannot be due solely to change ($P < .01$).

Happily, I have been able to identify another trend of comparable magnitude. Augmentation of the *Science* subscriber population seems to have paralleled that of P/R. It is rare and extremely gratifying that phenomena on such different levels can be linked. The best explanation I have found for the increase in *Science* subscribers, hinted at here but not detailed, appears in (*2*). After due reflection, I am driven to the unexpected conclusion that the P/R growth has been selected by readers, and most directly by paid subscribers. My compliments to the editor and publisher for making this selection possible by perceiving that an increasing fraction of the earth's population likes nonmystical explanations of natural phenomena and is preadapted to the consumption of more comprehensive scientific reports.

At the same time I still believe the sentence-lengthening trend should be reversed. My working hypothesis is that this is a parasite trend which has been able to hide itself in the rush of P/R change. Further, I claim that sentence lengthening has a negative value for the primary goal of greater scientific communication.

Table 1.

Year	P (No.)	R (No.)	P/R
1977	46.0	20	2.30
1976	25.2	13	1.94
1975	16.8	9	1.87
1974	25.0	12	2.08
1973	37.1	17	2.18
1972	33.7	16	2.11
1971	37.5	17	2.21
1970	49.3	24	2.05
1969	34.0	18	1.89
1968	33.6	19	1.77
1967	43.6	25	1.74
1966	36.2	20	1.81
1965	41.9	21	1.99
1964	28.0	15	1.87
1963	21.0	14	1.50
1962	8.0	7	1.14
1961	12.0	9	1.33
1960	14.0	12	1.17
1959	8.0	7	1.14
1958	9.0	9	1.00
1957	9.0	9	1.00
1956	10.0	9	1.11
1955	5.0	7	0.71

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1. R. Press, *Nature (London)* **268**, 476 (1977).
2. G. DuShane, *Science* **137**, 255 (1962).

The recent attack in the letter from Huxtable (15 July) on quantitative punctuational analysis was well taken; the amusing nature of his riposte makes an issue, which while it may be grave beyond simple concern for linguistic tradition, more often appears portrayed as a mild eccentricity of our materialistic, statistical society; however, before succumbing to the pleasures of satire, I, for reasons both connected to my classical education—beginning with 6 years of Latin in secondary school—and associated with my respect as a scientist, vitally tied by my profession to the printed word, for the value of precision in communication, might question whether this trivial-appearing matter does not have greater significance than the simple-minded penchant of modern pedants to assign numbers to matters of heart and taste but instead deals with the more essential question of the sophistication of our human thought processes in an era when $20 will purchase an electronic device capable of remembering and using ten levels of parentheses, two memories, one constant, and six hierarchical, grammatical functions, while human beings who, more machine-like than the machines themselves, are restricted usually by their own indecision to the multiple-choice format of exams, simple menus of fast-food restaurants, or the three channels of culture proffered at no cost by ABC, NBC, and CBS, and are, at their best, prominent and cultured citizens, authors of renown, winners of the Nobel and Pulitzer awards, who nonetheless limit the complexity of their grammar not to the legalistic elegance of a pages-long speech by Cicero, who was, perhaps, the noblest proponent of the parsimonious period to ever exist, to the Roman senate, but to short, clauseless, phraseless declarative sentences which, whatever their virtue as barroom expletives or exhortations by cheerleaders, can provide but little challenge to the 95 percent of our organic brain mass, which, all too sad, is never used.

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