and incorrect. The statement is irrelevant because Gilbert's conclusion "portrayed that aspect of modern information theory which relates to explicit coding systems intended to signal at high rates." It did not deal with the general applications of the theory. Although that very difficult problem has not been solved in a broad and general sense, nevertheless Bross's statement is incorrect because Gilbert's paper cites many significant steps toward the solution of the problem.

These steps include many excellent special solutions which have not found wide technological use because of economic limitations. These are tangible achievements. The economic limitation in technology is being reduced rapidly by the decreasing cost of devices for coding and decoding. Would Bross suggest that we abandon thermodynamics because most heat engines do not reach ideal efficiency?

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Excluding information theory, I have always had the impression that simulation and fields mentioned by Bross under the name of "mathematically oriented new sciences," are not "sciences" at all, in the full meaning of this word. These may be new tools in technological sciences, perhaps mathematical physics and the sociological sciences, constructed primarily for engineers, applied mathematicians, and theoretical sociologists (if the name is proper) to enable them to cope with more complicated problems.

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Experimentation on Humans

Your debate on the ethics of human experimentation (Letters, 13 May) reminded me of my undergraduate experience in 1927 when I served as a human guinea pig for a Nobel laureate, Professor A. V. Hill. Hill was always eager to explain his theories concerning oxygen consumption by the human being while working under stress. At the time he was testing the candidates for crew, he even apologized for not using his oxygen measuring device on himself under the stress of rowing. He found it impracticable, he said, since he had great difficulty handling both the stick and the sliding seat of a rowing machine.

Because I broke his record for the consumption of oxygen per unit of time while under stress of severe exercise, Hill paid me a great deal of attention. Later, when a track man surpassed my record, Hill was very eager for me to run with his device in an attempt to regain the "world's record for oxygen consumption," as he called it. Since running is a faster motion than rowing, he hoped that I would show greater oxygen intake. My coach was reluctant to give his permission as the rowing season was upon us and he feared running would make me lame. Although "jolly well disappointed," Hill would not consider testing me while the exercise stress was running. Throughout, Hill considered the convenience and welfare of his guinea pigs; the convenience of the experimenter came second.

Owing to my experience with Hill, I am strongly in favor of human experimentation, especially when the subject is also the experimenter. As a research scientist in biology, I have not hesitated to experiment on myself. Two years ago, when I developed symptoms of coronary disease I tested an essential trace element combined with a vitamin that had "no established minimum daily dosage." The results exceeded my fondest hopes, and numerous symptoms, including one that had been conspicuous for 40 years, disappeared.

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A Protest of Innocence

In his article, "Speaking of space" (13 May, p. 875), David McNeill gives credit (or blame) where it is not due when he imputes certain contributions to "space speak" to newsmen.

". . . some of the most popular specimens . . . [were] invented by newsmen . . . among these are *A-OK*, *blast off*, and *spin off*," McNeill says.

To my personal knowledge, "A-OK" was invented not by newsmen but by an imaginative public relations man named John A. Powers, who as "Voice of Mercury" of the flight of Alan B. Shepard in May 1961 attributed the phrase to the astronaut. Later it developed that Shepard had not said "A-OK," but by that time the phrase was a part of the English language, having been *adopted*, not *invented*, by newsmen.

I believe further research will show that *spin off* was invented not by newsmen but by NASA officials wishing to avoid the unpleasant connotations of the word *fallout*.

Blast off seems to have been carried over into science (fact) writing from science (fiction) writing, rather than having been invented *de novo* by newsmen. Whether *blast off* is "spurious," as McNeill suggests, is a matter of opinion; it is as precise in meaning as the engineer-approved word *liftoff* and a good deal more descriptive.

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Cowardly Patient

I wish to thank Preston J. Burnham for his proposed informed-consent form (Letters, 22 April). It is indeed heart-warming to learn that at least one member of the medical profession is capable of complete honesty and candor.

The matter is of personal interest to me because my doctor has insisted that I undergo the hernia operation Burnham outlined so eloquently. As explained to me, the prospect is not completely unthinkable, although terms like *incision, suture*, and others are obviously only synonyms for *hack, saw*, and *chop*. He has even been so devious as to recommend a surgeon who has many (perhaps thousands of) successful operations to his credit, at the same time avoiding mention of the untold numbers who must surely have succumbed to the "possible complications" Burnham listed.

The latter must be aware though, that his proposed form will meet with some resistance from the more reactionary elements of the medical fraternity. When I showed it to one of my neighbors (who is said to be a competent surgeon but whom I know to be a lousy golfer), he broke up in uproarious laughter. Obviously, this sort of person will obstruct general acceptance of the proposal.

I am confident that if devout cowards like myself would sign the consent form seriously, we could not only halt medical progress but perhaps even set it back significantly.

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Information Exchange Group No. 5

Several information exchange groups (IEG) have been created by the National Institutes of Health as a means of facilitating scientific communication in certain specialized fields. In essence, each provides a selected list of participants with preprints of articles as well as with recent comments or memoranda written by members. Information disseminated in this manner may be cited in formal bibliographies as a "personal communication" but not treated as published work.

At the annual meeting of the American Association of Immunologists in Atlantic City in April, there was considerable discussion of the merits of IEG No. 5, Immunopathology. Though it was agreed that the IEG represented an important experiment in the area of rapid and effective dissemination of the results of scientific research, a number of disadvantages were noted:

1) IEG communications are sent only to a limited number of members of the scientific community. The implied selection, which might be permissible for the private dissemination of preprints, was considered improper in an operation conducted by a governmental agency.

2) While the IEG clearly accelerates communication, it does not add to it, since the preprints are read by the same scientists who will later read the published articles.

3) While the preprints are not intended to serve as a substitute for formal publications, they do so in effect, since complete manuscripts are reproduced. The contention that they are "not published work" is meaningless since they are, to an increasing degree, quoted in formal bibliographies. Attempts by a single journal, such as the Journal of Immunology, to restrict such quotation are likely to be ineffectual. There was unanimous agreement that each memorandum should be clearly marked with the warning that it does not constitute a formal publication and may not be cited.

4) Since the preprints are complete publications, there is a real danger that they will reduce the usefulness of existing journals in the field of Immunology and may ultimately supersede them.

5) No refereeing process is provided for what is, in essence, a form of publication.

6) The IEG places undue emphasis on priority. It is thus abused by many