visors and colleagues and not from a remote, outside agency. Although some researchers of exceptional talent can be exempted, teaching, committees, and administration are essential parts of academic life. It demonstrates the effects of prolonged paternalism in this nation when scientists wish to be judged by government committees and to be excused by them from the chores asked by their local administration.

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Advertisements and History

With reference to Hägg's letter ("Saving library space," 2 Apr., p. 21), I suggest that . . . advertising furnishes one of the most important sources of information concerning technological progress and will be of continuing interest to historians of science. For some of the journals which I have bound, I give instructions that nothing be removed. . . . I have found much pleasure and profit in looking at the advertising in *Nature* during its early years in those volumes which were not stripped. This gives me a much better "feel" for the working conditions in science at that time than could be got otherwise.

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Art Is Here to Stay

La Fave's recent letter (12 Mar., p. 1242) is forthright enough to merit a rebuttal to his "Conclusion: Help stamp out art!" La Fave regards art and science as "cutthroat competitors." This seems to me to be a misconception which has no future, no past, and no documentation. Far from being inimical to one another, arts and sciences have always coexisted and have been able to do so because they are complementary frames of reference. The arts, in extreme form, are subjective, intuitive, and projective, while sciences, in pure form, are nonsubjective formulations tested against reality. Between the extremes arts and sciences intergrade and are frequently merely different ways of dealing with the same subject matter. A medical illustration and a painting by Dali might be done with the same medium and the same palette of colors and share as a subject the representation of a vital organ. The medical painting would not seek to evoke emotional responses or create lateral images or construct puns. The Dali painting would be a complicated image-cluster with punning and ambiguity, and having as a primary objective the stimulation of free association. These are different ways of speaking and each has its place. Both, incidentally, possess artistic appeal. . . .

Seeking to dispose of art, La Fave has contradicted himself by the use of a very acceptable writing style. Style is a socially preferred and culturally applauded esthetic practice. It is personal, pleasurable, in other words it is an art form. To be consistent and set to work right off to "stamp out art," La Fave should have presented his views in clumping, leaden prose. Displaying an awareness of esthetics is not the best way to brush the arts under the rug. This, fortunately, appears not to be something that many scientists want to do. Some of the best contemporary literary style I can think of is to be found in the pages of *Science*. Obviously, a number of contributors have enjoyed adding an element of art to their presentations. . . .

Wit and art are not less useful to us than mathematics. They may be much *more* functional. Mathematical languages are special inventions—constructs that supply us with unambiguous ways of encoding statements as well as clear instructions for decoding them. There are circumstances, however, under which we require ambiguity. The service that humor and art perform for us is to disguise, in socially acceptable ways, many of our antisocial urges. We need this release in order to survive as socially committed beings who can still keep their egos intact. Martin Grotjahn's *Beyond Laughter* (McGraw-Hill, New York, 1957) is a gold mine of information on the operations of dream-work, wit-work, and art in keeping us presentable to ourselves and to the neighbors—something which mathematics and science are not designed to do. . . .

A good case for the symbiosis of science and art is represented in the practice of medicine. Abstract science and the computer-processing of large masses of information are tools at the disposal of a physician, while the art of medicine provides him with another set of tools. For instance, if 105,000 different cases of heart ailments are broken into components for computer analysis, valuable discoveries can be made demonstrating associations between coronary attacks, weight, age, sex, social group, ethnic group, diet, profession, and so on. But the doctor does not say to an elderly heart patient, "Mrs. Jones, you're a statistical washout." Instead, he becomes an artist, applying his unique, personal experience, wits, and humane emotions. He takes some long-shot gambles . . . And never mind what the Univac said, Mrs. Jones recovers to spend another birthday with her great-grandchildren.

Therefore, let us not waste time and print trying to stamp out art. It is here to stay.

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Photosynthesis on Mars

Your recent editorial "The Martian environment" (6 Feb., p. 683), together with public discussions at the Biophysical Society meeting in San Francisco, prompted me to look into my files for a copy of a letter, dated 16 April 1961, to Phillip Morrison from myself. Since it may have some still useful thoughts on the search for Martian microorganisms, I communicate the main part as follows:

1. It appears to be physically impossible for microorganisms to survive (let alone grow!) at a surface subject to the intense ultraviolet radiation and the extreme dryness present on Mars. . . .
2. On the other hand, ultraviolet radiation and aridity could be readily overcome by a microorganism with a suitable skin. Therefore, the first Martian collecting box should take in a sample with a cookie cutter rather than a sticky tongue.
3. The best hope of demonstrating life in the sample lies in assuming an absolute minimum about the Martian "plants." I suggest as such a minimum that they are photosynthetic.
4. No matter what the detailed mechanism of the photosynthetic process may be, it should be demonstrable calorimetrically. That is, one could show that some of the light absorbed by the sample does not appear as heat. Confirmation of the inference of a biological mechanism might be obtained with an action spectrum.

Note that photosynthesis was measured calorimetrically nearly 30 years ago on earth. [See E. I. Rabinowitch, *Photosynthesis* (Wiley, New York, 1956), vol. 2, p. 1123].

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