# Letters

## "Art in Science"? No!

As a rule, artists don't attempt to barge into the columns of science magazines, but a point of esthetic honor is involved here, and something should be said.

D. G. Barry's "Art in science" (10 Dec. 1965, p. 1486) contains certain formulations that threaten the artist's traditional preeminence in his own field. Barry speaks of "forms and patterns as revealed by science" as having "esthetic elements in common with the forms and patterns created by artists." Elsewhere, referring to an exhibit organized by Mort Grant and himself, he says, " . . . we thus sought to provide evidence that science enables us to find beauty as well as scientific truth." The basis for my disagreement with the article lies solely in these two seemingly innocent quotations, for it is not science that reveals the beauty of nature, but the artist's vision alone. Even when science shows us wonders that are hidden from the naked eye, it is doing no more than providing us with the raw material of nature. It remains for the artist to translate this raw material into meaningful symbols.

Perhaps I'm a trifle touchy, but, as an artist, I don't like to see my territory invaded even by something as distinguished and respectable as an electron microscope. A micrograph of lens tissue may be beautiful, but its beauty is nothing more than an accident of nature and hence cannot, in itself, communicate ideas.

The purpose of a work of art, on the other hand, *is* to communicate ideas, and, in the process, to reveal aspects of nature we were never aware of before. This is what happens when, after seeing an exhibition of paintings by Renoir, you discover to your astonishment that every child you meet is a living "Renoir." Whistler had this in mind when he said that nature is always trying to imitate the artist.

Obviously, then, it is not science, with its modern telescopes and microscopes, which has "revealed" new kinds of imagery; it is simply that the artist, through the force of his imagination, has made it possible for us to see beauty in the "patterns, lines, and colors" that science has brought to light.

It is true that there is an amazing similarity between the imagery of science and that of much contemporary art. The Modern Art Museum is loaded with paintings that *look* like exploding galaxies, intestinal smears, and cross sections of frog muscle. But this formal similarity is misleading; it is, in fact, the key to the *dis*similarity between art and science. A close-up of the encrustations on an oyster shell, for example, might resemble the textures in a painting by Dubuffet, but the meanings of their respective forms are completely unrelated. To attempt to compare the two is to force each to be judged on the other's terms. If I were to make an abstract painting designed to express the nervous energy of a congested city street, I would hate to see it hung next to a computer-generated pattern merely to show off their similarities. I've seen too many paintings suffer, undeservedly, through such comparisons. Fortunately for the computer, it wouldn't feel a thing, because if it were judged on the painting's terms it wouldn't stand a chance.

The world is full of avid matchmakers who are determined to bring art and science together in suffocating wedlock. Why? Is this misalliance supposed to produce an art that is obedient to science, and a science that is pretty? This is a kind of artificial togetherness whose only common bonds are coincidence, superficiality, and wishful thinking.

I am sure, however, that there is a level where science and art are truly similar—where they share the intuition that has just sprung from their common social and physical environment. This intuition next emerges as a thinking technique (such as art or science) whose mode, or style, is a reflection of the total life experience. Investigation at this level could, conceivably, help us to discover the *real* similarities between Newton and Rembrandt, for example, or Einstein and Picasso. Somehow this approach seems better than simply staring in blank amazement at printed circuits and calligraphic designs that happen to look alike.

In spite of the matchmakers, I believe that art and science will always manage to remain comfortably apart except on those occasions when they must combine forces to produce necessary additions to living and knowledge—as in the case of the laws of perspective, which embody principles of art and mathematics, or in architecture, which brings together the concepts of the sculptor and the engineer. These are the significant relationships that exist, not the random, eye-catching configurations that are scattered haphazardly throughout the universe.

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## Chiropractic and Osteopathy

Now that Flynn's letter ("The legacy of the Flexner Report," 29 Oct., p. 554) has produced some pithy comment from an osteopath (G. Grainger, 24 Dec., p. 1666), it is only fair to make known the reactions of a chiropractor to both letters.

Flynn seems unaware that something analogous to the Flexner Report hit chiropractic schools more than 20 years ago, though it did not come, as in the case of the medical schools, from the outside. The upgrading which resulted was a purely endogenous reformation. Today all schools approved by the American Chiropractic Association are nonprofit institutions offering only a 4-year course, which embraces the basic and the clinical sciences, the theory and practice of chiropractic, public health, jurisprudence, and, generally, comparative therapeutics, as well as nutrition and mental health. They are equipped with laboratories for work in chemistry, histology, dissection, clinical pathology, and roentgenography, as well as every type of visual aid and adequate libraries. Their faculties are made up of seasoned practitioners, young chiropractors with academic degrees in the subjects which they teach, and nonchiropractor spe-

cialists in the fields to which they are assigned. Thus it is absurd to speak, as Flynn does, of "faulty . . . understanding of pathology." The graduates of these schools have learned pathology out of the same textbooks and by the same procedures as those used in medical schools. The proof of the pudding is that they are passing the same Basic Science Board examinations in pathology and the other basic sciences as those required of medical candidates.

Flynn is mistaken, also, in assuming that chiropractors serve only the unsophisticated. Their patrons run the gamut of social stratification, which extends from the humblest all the way to high church dignitaries, university professors, judges of the higher courts, members of Congress, governors of states, at least three past presidents of the United States, two past presidents of Mexico, and, in Europe, members of the royal houses of Greece, Denmark, Belgium, and Britain. In fact, in England, since the lower classes tend to rely heavily upon socialized medicine, it is largely the affluent who patronize chiropractors.

I do not share Grainger's high esteem for the quality of medical service which prevails in this country and agree with Flynn as to the need for a clearheaded study of the medical care the great mass of the American people receives. (Let any one who doubts this read the small booklet *Medicine*, an interview with the public health authority Herbert Ratner, M.D., published by the Center for the Study of Democratic Institutions as one of its *Series of Interviews on the American Character*.) Should such a study be undertaken, however, extraordinary precautions should be observed to guard against the dominantly hostile attitude of medical investigators toward heterodox healing arts. As E. Grey Dimond, of the Scripps Clinic and Research Foundation, put it [Letters, *Science* **142**, 445 (1963)]: "The clinician, because of the initiation rites of his club: after 10 or 15 or 20 years of thinking of sickness, not of health, and of responsibility for *a* patient, not a population, finds himself trained into a mold. . . . The fact that there may be a better way to care for the health and sickness of the population is occasionally suspected by the individual physician, but only occasionally."

Foreign medical literature of the last 10 years, especially in Germany, is replete with references to chiropractic—contributions to its theory, reports of clinical trials, and enthusiastic appraisals of its usefulness. American medicine, having long ago condemned chiropractic as quackery, must find this a very uncomfortable situation. The impact is reflected in the growing number of articles on manipulation now finding their way into American medical journals. A single recent volume of the *Index Medicus* contains more than 300 references to spinal manipulation.

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By definition and by proclamation, there are no courses on heterodoxy in an orthodox school. Thus, if the medic can learn all about osteopathy by not studying the subject, then surely the D.O. can be credited with learning something about medicine when he at least admits to a 4-year course on the subject. Flynn proclaims the deficiencies of schools he does not claim to have examined. Flexner himself examined medical and osteopathic schools alike, and let the chips fall where they might. His impartial report did not lead to the spawning of schools of osteopathy, as Flynn implies, but rather doomed some and strengthened others just as it did for the medical schools of the day.

When the concept of physiological prophylaxis was reborn as "osteopathy" in 1874, organized medicine was at its lowest ebb. Pain was enemy number one, signs and symptoms had lesser roles, but etiology, contagion, and mechanisms of communicability were being vigorously denied as late as the second decade of this century.

At this point in medical history an idea such as that of Andrew Taylor Still, the founder of osteopathy, that fever was to be controlled but not eliminated except by defervescence brought derision from the "regular" practioners.

The following is the essence of physiological medicine which Still rediscovered: Aggressive pathological mechanisms prefer the role of scavenger to that of predator. When any living structure is genetically, environmentally, or physiologically compromised, it becomes more susceptible to pathological aggressors. Conversely, when the living structure is relieved of its intrinsic and extrinsic burdens, it becomes less susceptible (and more hostile) to pathogens, other things being equal. (It is this variation in resistance that makes $LD_{50}$ a necessary concept in experimental biology.)

The prime difference then was that one group of practitioners often added to the burden of the ill by "meddling" with body chemistry (subtracting blood or adding substances known to alter the functions and thus the outward manifestations of disease), while the other aimed at reducing the burden by attempting to restore or establish conditions favorable to the patient and thus unfavorable to the disease. As always, the sane and sound course was as difficult to carry out with the patient as it was to sell to the profession at large. However, all this has been made history. Today's physician thoroughly understands pathological physiology, and today's science shows signs of conquering all but iatrogenic disease. When the psychologists perfect an objective test to measure ineptness, indecision, and incompetence, we will at last have the answer to Flynn's dilemma as to which of us is capable and which is culpable.

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## Scientists and Social and Political Problems

Scientists sometimes make me sick! I say this even though I am trained as a scientist and have had a scientific career. I am referring to the egotistical attitude of many scientists which makes them feel that they know best or that they have better solutions to political or social problems than those experienced in these fields. A case in point is the protest made by a number of scientists, from elite academic institutions, condemning the use of chemical agents by U.S. forces in Vietnam (News and Comment, 21 Jan., p. 309). I grant that the persons making the protest are scientists, but I do not believe that they are authorities in waging war or in resolving the situation in Vietnam. There is not anything in their training or background that makes them experts on the consequences of any act of our armed forces. What makes them believe that they have the correct view in regard to the use of chemicals of any kind in warfare? United action on the basis of being scientists adds noth-