

Letters

Society for Holistic Biology

"Welcome Biologists" was the greeting of every tavern and hotelkeeper in Atlantic City as participants arrived for the 47th. annual meeting of the Federation of American Societies for Experimental Biology. Such sentiment was, however, not universal. A thin but definite contrapuntal theme of disparagement for all, save molecular biologists, ran through many sessions; a thread which thickened to hawser-like dimensions at a Friday night symposium on biochemical education in which speaker after speaker (all prominent in biochemistry) reveled in a series of self-serving declarations, and an orgy of patronizing and wicked pebbling of traditional biologists ("bird watchers"). The climax of the evening may well have been when one of the speakers suggested that biologists were, after all, paranoid. This is perhaps comparable to an English sovereign clicking his tongue at the Irish.

The declarations all flowed from the unstated premise that "to be consonant with" means somehow "to be explicable by," an equation which appears in somewhat dulcified form as "the unity of the sciences" and which gives rise to a vigorous and plethoric pursuit of the most elegant artifact. The only letup in the castigation of biology came when there appeared to be a genuine contrition of the speakers themselves that they were not physicists or mathematicians and they paused for a moment of self-flagellation.

So deep is this atomistic prejudice and so inconceivable an alternative, that in personal dispute with its adherents one must immediately enter a disclaimer of *élan vital*.

Perhaps now biologists so exposed will be sufficiently aroused to heed the call of Barry Commoner [*Science* **133**, 1745 (1961)] and others, and rush to the defense of their science. Perhaps they will lift their bird-watching eyes and their *Urschleim*-picking hands and join forces in a Society for Holistic Biology. Perhaps such an organization can, to strengthen itself, turn for support to the still more complex social

disciplines; for one wonders how soon it will be before this burgeoning atomism engulfs them (at the moment too weak to warrant picking) and we are back, paradoxically, to the 18th century, or as Jimmy Durante—or was it Joe Penner—once said, "Diss muss be La Place."

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Function of Research Centers

I read with interest the editorial in *Science* (22 Mar. 1963) reporting the findings of the examination of scientific and engineering education in the United States conducted by the Organization for Economic Cooperation and Development. I was particularly impressed by one of the examiners' conclusions that the quality of teaching is declining, especially in the liberal arts colleges, partly as a result of the great emphasis placed upon research by the federal government.

Being a teacher in a liberal arts college and having conducted research in educational psychology for the government, I can see how the OECD examiners of American education came to such a conclusion. I have found that doing rather specialized research has tended to distract me from my larger teaching responsibilities. I have also felt the allurements of leaving college teaching and doing research in a university center.

Another interesting editorial appeared in *Science* (15 Mar. 1963) on the President's Science Advisory Committee report. One of the recommendations of the committee was that scientists and engineers "commit themselves deeply to the job of sifting, reviewing, and synthesizing information," since "reviewing, writing books, criticizing, and synthesizing are as much a part of science as is traditional research."

The two editorials suggest a basis for defining a healthy working relationship between small liberal arts colleges and large universities in the field of science.

As I see it, it is hopeless for small colleges to try to compete with large universities in the production of "front line" research. They simply do not have the facilities for doing so. Furthermore, the major task of the liberal arts college is to teach.

I do see, however, a very important role for the teacher to play in the liberal arts college in reviewing, sifting, and integrating research. Writing such reviews would not distract a college professor from his broad teaching responsibilities but would rather enhance his teaching, at least more so than does the production of research in a rather narrow, specialized field. Such reviews of research could also be of help to researchers in the universities, giving them a broader context within which to extend their specialized research than is now available to them in many instances.

Small colleges then might tend to become "review centers," while large universities could continue their role as traditional research centers. Such a division of labor need not be a rigid or restrictive one. If it could be established it might change the status of the smaller colleges with respect to the larger ones, improve communication between them, and enhance the function of each.

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Terrestrial Magnetosphere

Velikovsky's suggestion [V. Bargmann and L. Motz, *Science* **138**, 1350 (1962)] about a terrestrial magnetosphere is more in the nature of an ad hoc guess [P. Anderson, *Science* **139**, 671 (1963)]. Fortunately the existence of this phenomenon may be properly deduced from indirect experimental evidence: "The best explanation of these observations seems to be that there is a great bulge in the outer parts of the earth's atmosphere approximating a thick disk perhaps 30° or 40° wide" [G. Reber, *Nature* **175**, 78 (1955)]. Later some of the charged particles were found to be at about 3000 kilometers altitude [G. Reber, *J. Geophys. Res.* **63**, 117 (1958)]. These experiments and analyses were made during the pre-Sputnik era.

GROTE REBER

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