tion of the center of gravity (population) will be on the perpendicular bisector of the base, varying with the distance of C from the base; but regardless of that distance, the point of minimum travel for the three to convene will be a fixed point, the center of the equilateral triangle of which AB is one side.

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Choice of Discipline

The growing dichotomy in biology described by Barry Commoner [*Science* **133**, 1745 (1961)], a plant physiologist, is even more evident to those of us in the traditional areas. Paralleling the need he presents for a defense of biology is a need for defense of the individual who has chosen to work in biology. What are you to answer, for example, when a fellow scientist challenges not the quality of your research but, rather, the quality of your whole research area?

Having worked in one of the more traditional parts (floristics) of a classical biological discipline (plant taxonomy), I have several times felt a need to defend my choice of this area against the pronouncements not only of those outside my particular discipline but even of those within it.

The only satisfactory answer I have found is this: that the goal of modern science is to achieve nothing less than a *complete* intellectual mastery of the universe. In terms of this goal, no one area of scientific research is of intrinsically greater value than another; and it follows, therefore, that in the evaluation of his chosen discipline the scientist is autonomous.

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Food Additives

In their letter [*Science* **133**, 947 (1961)] Levin and co-authors discuss the question of an advisory board on problems related to the Delaney clause in the Food Additives Amendment. This question has been of serious concern to all manufacturing groups concerned with chemicals that come in contact with food. The provisions of the amendment, without this clause, are sufficient to enable the Food and Drug Administration to refuse registration to food additives that have been shown to cause cancer. Levin and co-authors stated that the "fact" should be considered that "the panel probably would be under heavy pressure from corporations who would want exemption *now* for additives for which there is *some* evidence of carcinogenic effect in animals." The reason for designating such an allegation as a "fact" is not stated. A comparable prediction would be that the panel would be under pressure by cancer investigators who want exclusion of additives for which there is a minimum of evidence of carcinogenic effect. Large sums have been made available by Congress for research in cancer because of the public fear of this disease. Investigators in the field of environmental cancer will inevitably be preoccupied with seeking indications of carcinogenic stimuli. Some of us feel that there has been a tendency to emphasize the danger from certain chemicals on the basis of equivocal scientific evidence, as we have previously noted (*1*).

The second point made by the authors relates to the difficulty of predicting safety on the basis of expecting less than 100 responses in a population of 10^8. This question was discussed at length by Seevers (*2*) some years ago, who, without invoking elaborate statistical procedures, correctly pointed out the impossibility of guaranteeing absolute safety from chemicals. He stated: "no method ever has been, or ever can be, devised which will permit in advance an exact prediction of human hazard . . . . No competent pharmacologist, toxicologist or clinician will undertake to guarantee that no risk is present in making available a new chemical for widespread distribution . . . . The degree of risk is calculated by balancing the toxicity of the chemical under conditions of use (its hazard) against its benefits to man."

Should production of tumors in animals under specialized experimental conditions by chemical stimuli be sufficient to cause the enduring label of "carcinogen" to be affixed to the chemicals? Estrogenic substances, examples of which are widely distributed in animal and plant materials (*3*), fall under the ban. Huggins, who reported the aggravating effect of a mixture of progesterone and estradiol on transplanted mammary fibroadenoma in rats (*4*), also has found that this mixture pre-

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vents hydrocarbon-induced mammary cancer in rats (*5*). Selenium, an old-time offender (*6*), has now emerged as an essential trace element, a deficiency of which causes serious problems in certain farm animals (*7*). Scientific, rather than legal, interpretations would seem to be the greatest need in the field of food additives. These interpretations should be made by those who will evaluate not only the risk of environmental cancer but also the need for chemicals in maintaining the food supply.

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Loyalty Oath: Another Viewpoint

Within recent years, the faculties of a number of American universities have voiced varying degrees of disgust, distaste, and dislike of the disclaimer affidavit required of U.S.-subsidized fellowship students. Some have established the policy of refusing to accept fellowship students who are subject to such an oath. Indeed, the precedent which seems to have been set by some of our most influential universities has led to the general assumption that those which accept students under such qualifications are betraying the ideal of academic freedom. As a teacher, I too vigorously cherish my right of academic freedom. Yet, there is a question as to whether the loyalty oath falls, at least in this case, within the scope of academic freedom. Personal freedom and national allegiance should certainly be compatible. If so, where does the problem lie?

There seem to be two basic objections to the requirement as it now stands, the first of which is felt by