Letters to the Editor

Federal Scientific Research

Under the title given above, R. G. Roberts and H. H. Beard (*Science*, 1945, **102**, 660) object to a proposal which they attribute to the "Board of Governors of Yale University." There is no such body. Reference to the article cited (*Science*, 1945, **102**, 524–525) reveals that the group in question is the Board of Permanent Officers of the Sheffield Scientific School—in other words, the full professors in the Division of Science of the Graduate School, Yale University.

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One World, Yet Different Biologies?

Although in his work, *One world*, the late Wendell Willkie wrote a good bit without saying anything, the concept implied in the title is currently attracting favorable attention, even among political leaders. Of all groups, one might have expected that scientists would be most insistent that there is but a single sort of their particular branch of endeavor—one biology, one chemistry, one physics, and so on.

Accordingly, it has been rather disconcerting to find successive articles appearing in recent issues of *Science* under the title "Soviet Biology." For, the use of a modifying term in this manner implies that there is some other kind of biology which is different and, presumably, inferior—perhaps racial, e.g. Polynesian Biology; or religious, as Baha'i Biology; or even, dare we say it, Capitalist Biology.

Mr. Editor, when further articles of this sort reach your desk, would it be too much to ask that you alter the title so that no racial, religious, or political term is permitted to modify the word science, or any branch thereof? If an article is headed "Shangri-La Biology," could it not be changed to "Biology in Shangri-La"?

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The Abstracting of Biological Films

The section on visual instruction in *Biological Abstracts* provides a useful service to prospective film users. However, its usefulness would be greatly increased if the coverage could be extended to all biological films. At the present time the section is limited to the fields of microbiology, immunology, and public health, which are reviewed by a committee of the Society of American Bacteriologists headed by Dr. H. E. Morton. Correspondence with the editorial office of *Biological Abstracts* indicates that they are very willing to publish abstracts of all biological films that can be located. Other societies have committees on visual instruction, but they have not been set up to furnish such abstracts. In some cases these committees list approved films for the benefit of the members of their societies. Other films do not appear on the approved lists because of errors or misconceptions within the films. However, the work of such committees would be much more useful if all of this information were made generally available in abstract form to a larger group of film users.

The present abstracts furnish precisely the information that a prospective user needs. By giving the shortcomings and limitations of a film the user can frequently adapt it to his purposes. Although useful information may be obtained from the *Educational Film Guide* published by H. W. Wilson Company, this publication does not ordinarily reach the desk of the biologist, and the information supplied is not complete. Adequate coverage of all biological films in *Biological Abstracts* would serve to keep the biologist abreast of this expanding field. It is to be hoped that the other biological societies may so constitute their committees on visual instruction that a program for abstracting all films of interest to the biologist may ultimately be worked out.

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Glutamine From Rye Grass

Greenhill and Chibnall (*Biochem. J.*, 1934, 28, 1422–1427) and Curtis (*Plant Physiol.*, 1944, 19, 1–5) noted marked exudation of glutamine on grass fertilized in the spring with nutrients high in ammonia. Greenhill and Chibnall did not get similar results later in the season, and Curtis was unable to reproduce the phenomenon.

In the tomato (G. J. Raleigh. *Plant Physiol.* In press) marked guttation followed the addition of either nitrate or of ammonium salts to solutions deficient in nitrogen. With the thought that a period of growth with low available nitrogen and consequent high carbohydrate reserves might be a prerequisite for glutamine exudation, domestic rye grass was seeded 25 September 1944, in flats with hardware cloth bottoms containing 1½ inches of potting soil. The flats were kept in the greenhouse until 28 October when they were moved out-of-doors to a sheltered area. In order to facilitate leaching, they were placed on cinders approximately 8 inches deep.

By 28 March the rye grass had made good growth but was light in color, indicating nitrogen deficiency. From that date to 26 June a total of 52 flats were fertilized with ammonium chloride dissolved in water at the rate of 300 pounds of the dry salt to the acre at 8 different times during that period. In most cases, the grass was clipped before the applications of fertilizer. The NH_4Cl was applied in mid-afternoon on days when the weather prediction indicated a clear, cool night.

Without exception, usually on the first or second day following fertilization, nitrogen-deficient grass produced quantities of exudate sufficient to make it possible to collect it, by clipping and drying the grass, rubbing it

lightly, and collecting the dry exudate thus dislodged. One lot so collected was dissolved in water so as to float and settle off the particles of grass and part of the solution treated for two hours at 100° C. at pH 6.5 in accordance with the methods of Vickery, *et al.* (*Biochem. J.*, 1935, 29, 2710–2720). A marked increase in ammonia following the treatment indicated the presence of glutamine. A total of 12 flats fertilized at three different times while the grass was making rapid growth of dark green color following earlier applications of NH_4Cl produced relatively little or no white exudate.

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Captain Jenkins' Views

The objections of Captain John G. Jenkins, USNR, to the universal application of statistical methods to research in psychology probably are well taken. Indeed, these objections may well be extended to many fields of scientific endeavor and to many methods of research. Any circumscribed test assumes that certain ideal conditions shall be fulfilled, but in reality the ideal is seldom present or even achievable. Therefore, any single test reveals only one aspect of the situation. Usually the situation is far more complex than we imagine.

The chief injury of the standardized test arises not from its limited nature, but from the mental attitude of investigators that all research must be fitted to some particular test. However, all tests are only tools and like machine tools they are useful in some, but not in all, situations. Years ago Fabre pointed out this discrepancy between the ideal tool and the actual situation. Although the inimitable observer failed to appreciate the marvelous adaptability of Darwin's theory, his words from "A dig at the evolutionists," translated by Alexander Theixeira De Mattos, are applicable to the present situation:

"But to this calculus, all-powerful so long as it does not leave the domain of the ideal, let us submit a very modest reality: the fall of a grain of sand, the pendular movement of a hanging body. The machine no longer works, or does so only by suppressing almost everything that is real. It must have an ideal material point, an ideal rigid thread, an ideal point of suspension; and then the pendular movement is translated by a formula. But the problem defies all the artifices of analysis if the oscillating body is a real body, endowed with volume and friction, if the suspensory thread is a real thread, endowed with weight and flexibility; if the point of support is a real point, endowed with resistance and capable of deflection. So with other problems, however simple. The exact reality escapes the formula."

PAUL D. HARWOOD

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. . . I think *Science* is to be complimented on Captain John G. Jenkins' article (*Science*, 1946, **103**, 33–38). The general indictment against the technical man, and it is not without some basis, is that his scientific approaches and thought patterns are devoted to obscure fields without any realization of practical value. While the scientific purity of thought is highly commendable it would appear that some of the effort in that direction would have greater significance if interpreted in the light of some of Captain Jenkins' remarks.

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Pancreatic Enzymes and Liver Fat

The late Dr. A. H. Palmer was well known for his work on the proteins of milk whey. He joined this department in September 1944 and undertook at my suggestion the separation and identification of enzymes present in the antifatty liver fraction of pancreas, prepared by the method of Entenman and Chaikoff (*J. biol. Chem.*, 1941, 138, 477). Palmer's work was hampered by ill health and terminated by his death on 10 April 1945. During his short period of application to his new problem, however, he obtained in crystalline form and in fair yield trypsinogen and chymotrypsin from the pancreas extract. He identified these two enzymes to his own complete satisfaction and believed that at least one more proteolytic ferment was present in the extract.

Chaikoff, Entenman, and Montgomery (*J. biol. Chem.*, 1945, 160, 489) state that their findings are consistent with the concept that the antifatty liver factor (of pancreas) is enzymatic in nature. The results of Palmer's work provided evidence in support of this view, and it is most regrettable that his notes are not sufficiently complete to enable us to make a detailed report of his findings. Some of his preparations are still available, however, and it may be possible to complete certain aspects of his work.

The probability that the enzymes contained in the pancreas which is fed to depancreatized dogs contribute very significantly to the total lipotropic effect by releasing lipotropic factors from the various constituents of the diet has been emphasized in previous reports from Chaikoff's and this laboratory. The possibility that these enzymes played a role in the prevention of fatty livers in insulin-treated depancreatized dogs was, of course, mentioned and seriously considered by Prof. J. J. R. Macleod and his collaborators in the original work in this field.

C. H. BEST

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Absorption of Phenol Vapors by Plants

An interesting phenomenon concerned with the absorption of phenol-like vapors by plants was observed during the Summer of 1945 in and about Ambler, Pennsylvania. A factory located on the outskirts of Ambler started the commercial production of 2,4-dichlorophenoxy acetic acid (2,4-D). This product has been used as a plant growth regulator and has been developed by the Bureau of Plant Industry, Soils and Agricultural Engineering, as a weed killer.

In the production or purification of the product at