Letters

Ph.D. Language Requirements: California Survey Results

In Berkeley, as elsewhere, many graduate students consider Ph.D. language requirements a waste of time. In an effort to discover *how much time*, a committee of the Graduate Association of Students of Psychology completed a questionnaire survey in all departments and submitted a report to the membership on 27 Jan. 1967. This report showed mean figures on student estimates of the number of months of full-time study used to meet language requirements for the Ph.D. As firm data on net study time outlay are largely unavailable, a rough summary of the results of our survey may provide a useful contribution to discussion of language requirements recently appearing in letters (24 Mar., 30 Dec., and 30 Sept.).

Of 1200 questionnaires mailed to graduates randomly selected from all departments at Berkeley, an estimated 1000 reached the addressees; 440 were filled in and returned. A total of 324 students seeking the Ph.D. provided estimates which were reduced to the following figures, reflecting mean number of months of full-time study per student: Across all departments ($N=324$), 4.1 months full-time study; hard sciences ($N=119$), 3.1 months; life sciences ($N=82$), 4.3 months; social sciences ($N=80$), 4.1 months; foreign languages ($N=22$), 4.9 months; English ($N=21$), more than 10 months. English department estimates are not comparable to the others because many exceeded the scales provided by the questionnaire form.

In addition to estimates of study time outlay, 222 respondents provided spontaneous "remarks." In these remarks, 71 students expressed this view: "Foreign languages are irrelevant to and useless in my academic program and career plans"; 67 students expressed the opposite view: "Foreign languages are an essential part of my academic and career plans." A total of 45 students remarked: "Current Ph.D. language examinations are unrealistic because they can be passed without having useful control of the language"; 12 students expressed the opposite view: "A little language (dictionary hunt and peck) is adequate to the needs of the scientist in my field." One would expect humanities students to have a higher regard for language than students from the science departments. However, the above comments were fairly evenly distributed across all departments. Making allowance for the difficulty of scoring freely expressed remarks, it is still fair to state that approximately half the science students who expressed themselves felt that language studies were worthless; on the other hand, half felt that language training is very important and should receive increased attention.

At Berkeley there are now approximately 8000 doctoral students. Considering the dollar cost of training this group, we make the reasonable assumption that the average instructional cost per student (for faculty and facilities) is $300 per month: then 4 months added to each degree program for language training increases the University's cost by a figure in the neighborhood of $9.6 million. If we also consider the cost to the student, the overall outlay approaches $20 million.

The language committee expressed the opinion that 4 months of full-time study falls far short of what is needed to obtain useful control of one foreign language. Nevertheless, this time cost represents a serious economic factor to students and institutions. Accordingly, it was recommended that efficient modern language training be provided for those students whose temperament and career plans give reasonable evidence that they will benefit, while those students whose motivation and career plans indicate no probable benefit should be urged to devote their time to statistics or other "tool" courses relevant to their academic and career needs.

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Centrifugation of Oil Slicks

The problem of pollution of water by oil slicks, discussed in Abelson's editorial (26 May, p. 1037), reminds one that the separation of oil from water is a classical chemical engineering operation which can be easily achieved by such methods as distillation, solvent extraction, settling, and centrifugation. One of the cheapest methods is to use a centrifuge similar to that used in the old-fashioned cream separator which separates two liquids on the basis of their differences in density.

It seems to me that the cheapest way to remove oil slicks would be to have a floating V-shaped boom which could be towed through the water. At the apex of the V, the mixture of oil and seawater would overflow into a barge or tanker fitted with pumps and storage tanks. Centrifuges would separate the oil from the seawater; the oil would then be run to storage tanks and the seawater returned to the ocean.

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NSB: A Difficult Birth

Walker's article on the National Science Board (28 Apr., p. 474) is perceptive but omits some factors that must have influenced Vannevar Bush and others in trying to establish the National Science Foundation with a fully responsible Board. Certainly Bush was not so naïve as to try to establish an organization about which it could be said: "It was too much to hope, of course, that such an idealistic arrangement would meet with either congressional or presidential approval." The "idealistic arrangement" was approved by Congress but was vetoed by President Truman. As I remember it, this veto came as a complete surprise.

The original enabling act was modeled closely after the organization of the National Advisory Committee for Aeronautics (NACA) which was established in 1915, and was, in turn, modeled after a British organization. The NACA was originally composed of 12 members appointed by the President (without the advice and consent of the Senate). The number of members was increased to 15 in 1929 and to 17 in 1948. The law said the members "shall be acquainted with the needs of aeronautical science,

either civil or military, or shall be skilled in aeronautical engineering or its allied sciences." The members elected their own chairman and exercised all the powers mentioned by Walker with regard to the original concept of the National Science Board. . . .

The NACA enjoyed great prestige and authority in all scientific and engineering matters concerning aeronautics. This prestige resulted from the character of its members and the excellence of its staff. There is every reason to suppose that the National Science Foundation would have enjoyed similar prestige in its wider field if Bush's plan had succeeded. It is interesting to note that the NACA also enjoyed excellent relations with the Congress, and generally with the White House under seven presidents. Wilson was originally hostile and the NACA was established only as a rider to a Naval appropriation which he could not very well veto. His attitude changed after entry into World War I. Hoover was also hostile throughout his entire connection with government. Truman was an active supporter of the NACA, which made his veto of the original National Science Foundation bill the more surprising.

Bush served as vice chairman of the NACA in 1938 and as chairman in 1939–40. His knowledge and admiration of this organization is apparent in his attempt to set up the National Science Foundation in the same pattern. It is unfortunate that this successful experiment in governmental organization of scientific research came to an end in 1958 with the National Space Act, and that it has been all but forgotten.

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Long-Term Drug Dangers

In addition to those drug catastrophes discussed by Modell ("Mass drug catastrophes and the roles of science and technology," 21 Apr., p. 346), I think we can consider another type of situation. Let us assume that a drug (such as a combination psychic energizer and diuretic) with no known side effects is aggressively promoted and very widely used throughout North America and Europe. Some 16 years after its adoption, the first hints of unexpected side effects begin to appear and several more years are required before they are con-