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4 January 1955.

Communications

Educators Sampled from an Undefined Population

"The most neurotic, as a class, are the scientists and our experience has been that biologists as a group exhibit more picayunish tendencies. . . . Professors of petroleum geology and other highly specialized engineering subjects sometimes seem to be plain downright ornery," writes Robert C. Cook, editor of the recently published 16th edition of *Who's Who in American Education* (*1*), on the second page of prefatory remarks referring to his editorial contacts with various educators during a period of 26 years. *Who's Who in American Education* is a companion volume to *Leaders in American Science,* concerning which Branson (*2*) has commented adversely. Perhaps *Who's Who in American Education* has certain characteristics that tend to disrupt the careful scientist's emotional balance and thereby lead to "neurotic," "picayunish," and "ornery" behavior.

Branson concluded that, because of errors and omissions, *Leaders in American Science* would have been more appropriately entitled "Some Americans Interested in Science." As a sequel to his note, we have attempted to estimate the coverage of *Who's Who in American Education.* There are five possible ways in which a person might be treated: current listing, including photograph (CP); current listing, no photograph (C); name listed, but reference made to a previous volume—that is, entry not up to date (L); name listed, but reference made to *Leaders in American Science* (LAS); not listed at all (N).

How fully are various populations of prominent professors of education, educational psychologists, and psychologists represented? First, we searched for the names of the 15 full professors working primarily in the department of education of the University of Wisconsin who do not have major administrative responsibilities. *Who's Who in American Education* does not list 12 of them (80 percent) at all; for two we were referred back to volume XIV (1949–50); only one person (7 percent) has a current listing, without photograph.

According to official records (*3*), there were 210 fellows of the division of educational psychology of the American Psychological Association on 1 Jan. 1954. They fall into the five categories outlined: CP, 7; C, 36; L, 22–15 (vol. XV), 6 (vol. XIV), 1 (vol. XII); LAS, 0; N, 145. Thus, only 43 entries, or 20 percent, are current. We cannot discern any basis for inclusion and exclusion. Such widely known professors as Yale's Carl I. Hovland, Duke's G. Frederic Kuder, Columbia's Irving Lorge, and Ohio State's Sidney L. Pressey are omitted altogether.

A third suitable population seemed to be the 207 members of the American Educational Research Association (*4*) who are full professors of education or closely allied fields, such as educational psychology and science education, and who do not have major administrative assignments. *Who's Who in American Education* gives current listing to 54 of these (26 percent), 18 with photographs. The 1953–54 AERA president, Guy T. Buswell, does not appear at all.

Last, we looked for the names of the 30 presidents of the American Psychological Association who were living when the 16th edition of *Who's Who in American Education* went to press, from O. Hobart Mowrer in 1954 to Robert S. Woodworth in 1914 (*5*). There are current listings for only four of them, or 13 percent.

From these searchings among prominent educationists and psychologists, it seems probable that, aside from listing an unstated percentage of certain types of school administrators described in its preface, *Who's Who in American Education* samples no definable populations of "educators." Despite the editor's assertion that "Volume Sixteen should contain the names of almost all of the superintendents of school systems in cities of 25,000 or more population," the two we sought (for Atlanta and Madison) were missing. Appearing in the volume are some classroom teachers ("You may be sure that any classroom teacher included in this volume was listed because he or she has been recommended by a responsible educator"); college teachers of all ranks, in nearly every conceivable field, and from many types of institutions; administrators at practically all levels; and noninstitutional educational workers of many types.

In his preface the editor complains that it is hard to locate the names and addresses of members and officers of various organizations, but this is certainly not true of the four populations we investigated. For example, all current members of the AERA are listed each year in the December issue of the *Review of Educational Research,* a widely circulated journal. Members of the American Psychological Association

and all officers from the beginning of the association in 1892 are listed in the official directories, published each year or two and available in many libraries.

It seems obvious that the volume would have to be at least five or 10 times its present length (1406 pages) in order to include all "eligible" individuals, for if one is to judge by the qualifications of persons listed, most employed educators, especially at the college level, meet its minimum requirements for "eminence."

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1. Published by Who's Who in American Education, Nashville, Tenn., copyright 1954, to cover the period 1953–54.
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Change in pK'_a of Representative Compounds with Solvent Composition

Determination of the apparent dissociation constant (pK'_a) by the potentiometric method is a useful tool in qualitative organic structural chemistry, in the estimation of molecular weights or purity of samples and as an adjunct to absorption spectrophotometry (*1*). In the course of these operations, samples are often found inadequately soluble in water for accurate titration, so that a solvent-water mixture is necessary.

The apparatus (*1*) works well with mixed solvents, generally to concentrations containing as little as 10 to 20 percent water. Below these concentrations, the system may behave erratically. The pK'_a values are usually modified in mixed solvents, depending on such factors as the solvent, the solvent concentration, and the nature of the dissociating group. These variations may provide additional information for the assignment of structure.

In order to use the change in pK'_a with solvent composition in group identification, it is necessary to know the expected direction and magnitude of the changes. These have been determined for a number of representative compounds with different solvents, for example, ethanol (*2*) and dioxane (*3*). In this study (*4*), ionization changes for compounds that are useful in the pharamaceutical field are examined in the alcohols and in two particularly effective solvents, dimethylformamide (DMF) and dimethylacetamide (DMA).

Techniques for titration, calculation, and determination of pK'_a have been described (*1*). In the preparation of mixed solvents, measured volumes of distilled water and of solvent were combined. Percentages refer to volumes of the pure components; thus, a 40-percent methanol solution was prepared by delivering 1.2 ml of methanol and 1.8 ml of water into the titration vessel. Solvents were checked for suitable physical characteristics and redistilled if necessary. The samples were commercially available materials of sufficient purity to yield satisfactory titration curves, selected to provide types of ionization common in structural identification work, individually and in combinations within the same molecule.

Results of the titrations, taken at a room temperature of 25°C, are shown in Figs. 1 and 2, in which the pK'_a is plotted against the concentration of organic solvent. The following observations may be made on these data.

All the acidic groups (carboxyl or phenolic hydroxyl) are greatly weakened by the addition of organic solvent. This is also characteristic of dibasic acids, where both groups show a large increase in pK'_a. The increase in pK'_a is generally greater with DMF and DMA than with the alcohols, and the smallest increase in pK'_a is with methanol.

Amine groups show comparatively little change in strength with change in solvent. In otherwise uncharged molecules, they are decreased slightly. In the zwitterion amino acids, the basic group or groups may be strengthened slightly in some solvents. Shifts in pK'_a with DMF and DMA tend to be greater than with the alcohols.

The response curves obtained with DMF and DMA indicate that these solvents are essentially interchangeable in titration experiments.

Although they follow these general trends, the curves of change in pK'_a with change in solvent do not behave in a uniform manner from solvent to solvent or between different compounds in the same sol-

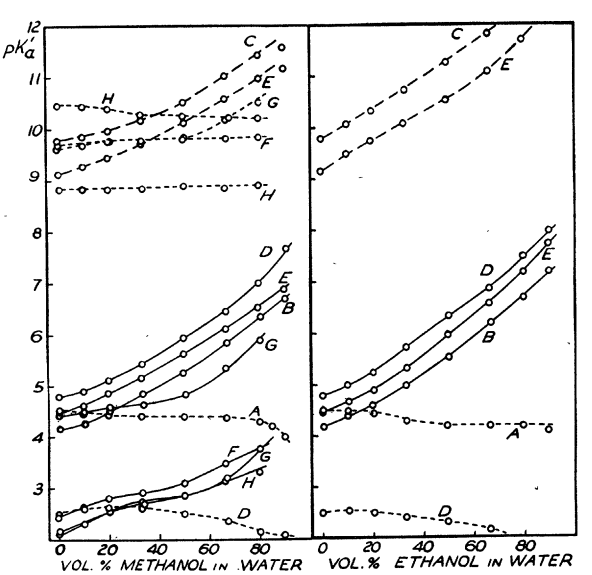

Fig. 1. Change in pK'_a with volume percentage of alcohols in water. Solid lines, carboxyl groups; dashed lines, hydroxyl groups; dotted lines, amino groups. The compounds titrated are identified by letters: (*A*) aniline; (*B*) benzoic acid; (*C*) phenol; (*D*) *p*-aminobenzoic acid; (*E*) *p*-hydroxybenzoic acid; (*F*) *dl*-alanine; (*G*) *l*-glutamic acid; and (*H*) *l*(+)-lysine.