

THE PROBLEM OF APTITUDE TESTING IN PHARMACEUTICAL
EDUCATION.*BY SAMUEL S. LIBERMAN.¹

The development and application of the psychological test, frequently called the intelligence test, has been very great during the last two decades. Although the psychological test had previously been utilized by Cattell and others, Binet's announcement in 1908 of "a scale for measuring intelligence" occasioned quite a stir. Various improvements on the original Binet test were made and various modifications were devised. It was not until 1917 that the full significance of these tests was made apparent. At that time, the United States entered the World War and the War Department decided to utilize psychological tests on the recruits as a rapid method of separating the men on the basis of their mental equipment. A. S. Otis, who at that time had already developed a series of tests, donated to the army the results of his efforts (1). Two batteries of tests were developed using the Otis tests as bases, and were denoted as the "Alpha" and "Beta" modifications. The results were, to say the least, interesting. The use of these tests naturally served to direct an enormous amount of public interest toward them. After the war, the Army Alpha, as the test was known, was used in industry as a means of selection of employees. The indiscriminate utilization of these psychological tests as a means of forecasting aptitude resulted in failure and disappointment. The entire testing movement as a result fell into disrepute.

American educators, however, had long felt that a test or series of tests of this type could well be used as a means of determining to some extent the mental equipment of the great body of students in the secondary schools and colleges of this country. The idea caught, with the result that we have available a large body of data on intelligence tests and intelligence testing.

We are all well acquainted with the rapid rise in the use of the general intelligence test as a means of predicting academic success. It has also been used as an instrument of guidance in the training of young men and young women in the secondary schools. But the intelligence test, as such, is an indifferent instrument and quite inadequate as a means of predicting aptitude in specialized fields.

A great number of studies have been made in which ratings received on intelligence tests have been correlated with grades received in the various subjects on the secondary and college levels. Unfortunately, some of the earlier studies are of little value, due to the subjectivity of the methods of grading in the secondary schools and colleges. Nearly every type of mental test and educational performance test has been used as a means of obviating this discrepancy. The results have been tabulated and correlated, so that we now have at hand several series of standardized tests for which norms have been established. We can see the importance which has been attached to the results obtained on these intelligence tests by noting that they are used by a large number of colleges for various purposes.

In an attempt to overcome pupil variation, a modified form of performance test was devised, and called a placement test. This specialized test has been prepared for many subjects. Cornog and Stoddard, of the University of Iowa, prepared

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one for chemistry, “. . .with the object of getting a better prediction of student performance in freshman chemistry than is ordinarily secured by the general intelligence tests” (2). The coefficient of reliability of these tests is much higher than that obtained by the use of intelligence tests alone. While approaching it, these tests do not determine special aptitudes. As Hull (1) puts it, “. . . . if a test is to be of any particular value, it must enable us to forecast a *particular* aptitude or group of aptitudes”

Special tests, known as aptitude tests, have already been devised for various trades, as well as for various academic subjects. By means of these tests, characteristics peculiar to a certain trade or subject can be measured in an individual. A Scientific Aptitude test has been devised by Zyve of Stanford University (3). Special aptitude tests in engineering, medicine and law are used by various colleges, apparently with success, as a means of selection of prospective students. It seems, therefore, that it should be possible to devise a battery of tests to determine aptitude for pharmacy.

Objection will at once be raised on the ground that pharmacy, unlike medicine or law is more of a business than a profession. It is not the function of this paper to settle this argument. But it may be pointed out that several studies have been made in an effort to establish a correlation between scholarship and success as measured by salary and that the results have been positive. One study, made by Bridgman in 1930, involved the correlation of success of 3806 college graduates in the employ of the Bell Telephone System, with their scholastic standing. He found that high scholarship was an important factor in later success (4).

The solution of this problem is not simple. Dogmatism must be avoided and in formulating any program involving the application of tests of this nature, a scientific attitude must be maintained. What we are looking for is a battery of tests which will enable us to predict with fair success an aptitude for pharmaceutical practice. No one single test can do this. It is possible that an indication of pharmaceutical aptitude may be predicted by means of

1. Determination of general scholastic aptitude and correlation with grades received in college and on state board examinations.
2. Determination of specific ability as measured by a special battery of tests, previously standardized and correlation with grades received in college and on state board examinations.

Admittedly, we are not in a position to predict success in later life in the practice of pharmacy. We should, however, try to correlate data available. But we should also bear in mind the pronouncement recently made by Dr. Kitson of Teachers College, Columbia University. “A test,” he said, “may help an employer choose the best two out of a hundred applicants for a certain position”

At this time, I wish to propose a possible series of tests, some of which are already available. This series would include tests for

1. Reading and comprehension.
2. Manipulation.
3. Reasoning and interpretation of directions.
4. Mathematical ability (particularly in arithmetic).
5. Inventiveness.

The reasons for this series, for the most part, are obvious. The ability to read and to understand what has been read is of great consequence. The ability to

properly manipulate apparatus and, as a corollary, compound prescriptions is probably the most important item. In order for the pharmacist to compound prescriptions properly, a certain amount and kind of innate reasoning ability is necessary, which is related in some way to the fifth of the series, inventiveness. My reason for the inclusion of a test for mathematical ability may appear odd, but in my experience, I have found that students deficient in the ability to use arithmetical processes are poor material in so far as their records at pharmacy college are concerned. I need not emphasize the importance of this in connection with the practice of pharmacy.

What is also required is an efficient job analysis involving the duties of the professional pharmacist, which is necessary as an aid in the construction of a suitable aptitude test. Work along this line has already been carried out and the results published by Charters, Lemon and Monell as the "Basic Material for a Pharmaceutical Curriculum."

It must be remembered that a project of this kind, to be of value, must be carried on for a period of not less than ten years, probably longer. Furthermore, it will be necessary to gain the whole-hearted support of the Colleges of Pharmacy and as well, that of pharmaceutical associations. Without coöperation, this work cannot be done as it should be.

BIBLIOGRAPHY.

- (1) Hull, C. L., "Aptitude Testing," Yonkers: World Book Co., 1928.
- (2) Cornog, J., and Stoddard, G. D., "Predicting Performance in Chemistry," *J. Chem. Ed.*, 2, 701-708 (Aug. 1925).
- (3) Zyve, D. L., "A Test of Scientific Aptitude," *J. Ed. Psych.*, 18, 525-546 (Nov. 1927).
- (4) Bridgman, D. S., "Success in College and Business," *Personnel J.*, 9, 1-19 (June 1930).
- (5) Charters, W. W., Lemon, A. B., and Monell, L. M., "Basic Material for a Pharmaceutical Curriculum," New York: McGraw-Hill Book Co., 1927.

ALONZO ROBBINS, PENNSYLVANIA'S NUMBER ONE PHARMACIST.*

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Very often a pharmacist who has established himself firmly in professional circles in his state, and who has taken great interest and much responsibility in his state organization, earns the title of "leading druggist," "foremost pharmacist," or "the state's most prominent man in pharmaceutical affairs." The subject of this paper, Alonzo Robbins, was, in truth, all of these, for his Pennsylvania State Certificate, entitling him to practice as a registered pharmacist, has the distinction of bearing the Number One.

It was in 1887, on June 23rd, that the Governor of the great Keystone State created a Board of Pharmacy for the purpose of examining and licensing those who wished to pursue the art and the science which treats of medicinal substances. Until that time there had been no state supervision, and little or no local looking-after of pharmacists, although Philadelphia had exercised some control over its druggists.

Naturally, the first Pennsylvania State Board needed a leader, and Alonzo Robbins, who was then in business for himself at 11th and Vine Streets, in Philadel-

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