

ests, special abilities and occupations. It must be given under conditions as natural as possible. Reasons for it should be clear and unequivocal. If given to groups of employes, results should not alter existing conditions except as a standard for accessions and layoffs in the regular course of employment. The reliability of the tests should always be known, that is, whether a given test when repeated would give similar results or not. Scoring procedures should be so standardized that persons scoring the examination papers independently will obtain like scores. The above techniques are important in preparing the test.

4. *Validity of Tests.* The fundamental requirement of a test is its validity. Does it select the persons who are fitted for the work? Does it rank workers according to their ability to do the work? Will it predict?

Mathematical calculations are necessary to determine reliability and validity. Suppose these indicate satisfactory results. Shall we use the test in selection and placement? There may be more expeditious and cheaper methods available. Usually these will not produce objective labor standards such as are available from a valid test. If such standards can be established without the use of any form of test and be used more rapidly and more cheaply the test would be superfluous. A successful test must increase our success in the accurate handling of the employment process.

Mental Alertness Tests

Mental alertness tests have appeared in numerous forms since the war period. The majority have been devised for testing numbers of individuals in groups. Most of them can, however, be used to obtain data of value in individual cases. As an illustration of a simple type, we give here the instructions and sample questions from Bureau Test VI. This test is based on Army Alpha, the test used in the selection and placement of recruits in the United States army during the war. It does not use Parts 1 and 3 of the army test. Instead of keeping the items or questions in groups, the questions are mixed or "scrambled." The instructions are written out in full and read through completely before the subject writes any answers. Practically no writing, beyond a few numerals, is required. Four minutes is allowed for reading the instructions. When the group is unfamiliar with

such tests a longer time may be permitted. The test may be given and standardized with or without time limits. Best results seem to be obtained in this case by the use of time limits.

Tests similar to these (illustrated in Figure 1) will usually be found useful as a preliminary in any group survey of applicants or workers. The data are easy to obtain and can in many cases be with profit made a regular part of the employment routine, provided they are administered by people thoroughly trained in their use. In conjunction with special ability tests and the trade test they can gradually be formed into labor standards of great value.

In certain instances, such as clerical work of all grades, some type of mental alertness test has thus far proved to be the best single criterion. As a measure of learning ability under every variety of condition, it seems to be the most generally reliable test. As a standard to parallel increasing complexity in a series of positions, it comes nearest to predicting those who will drop out because of the greater difficulties involved.

This relation between average test score and classification of the job on the basis of complexity can be seen in the following table (Table 1).

TABLE 1^a
Average Test Score and Classification of Job

GRADE OF WORK	AVERAGE SCORE
A (Office Boys)	52
B	91
C	118
D	102
E	107
F	113
G (Supervisory)	130
Typists	90
Stenographers	106
Secretaries	120

Grade C is largely composed of an emergency group of workers, many of whom were slated for promotion at the time the tests were given.

When compared with ratings of supervisors it is found that in general those clerical workers making the higher intelligence scores receive superior ratings on efficiency. Two things occur with respect to permanency of service. Persons who make high scores on the test remain if their pro-

^aAdapted from Table 2 in "Psychology in Business," *Annals of the American Academy of Political Science*, Vol. CX, 1923, p. 65.

motion is fairly rapid or assured. Those who test low and yet are hired for relatively complex jobs fail to give satisfaction and are quickly dropped from the force.

Precisely similar results were found by the use of a test of the same general type in factory work.

DIRECTIONS

Inside this booklet you will find a lot of things to do. Samples of all the different kinds of things to be done are given below. Read the samples and directions carefully.

- (a) How many men are 5 men and 10 men? **Answer (15)**
Write the correct answers to such problems, as indicated.
- (b) good—bad **same—opposite**
The words "good" and "bad" are opposite in meaning, and the thing to do, therefore, is to underline opposite, thus: good—bad **same—opposite**
little—small **same—opposite**
The words "little" and "small" mean *nearly* the same thing, and, therefore the thing to do is to underline **same** thus: little—small **same—opposite**
- (c) a cats cow grass **true—false**
These words can be arranged to form a sentence, as follows:
a cow eats grass.
This is a true statement. Therefore the thing to do is to underline **true**, thus:
a cats cow grass **true—false**
Do not write the sentence.
horses feathers have all **true—false**
In this case, the words, when rearranged, make a false statement:
all horses have feathers.
Therefore, the thing to do is to underline **false**, thus:
horses feathers have all **true—false**
- (d) 2 4 6 8 10 12
If the plan in this series of numbers were carried further, the next two numbers would be 14 and 16. Therefore, the thing to do is to write 14 and 16 in the two spaces provided, thus:
2 4 6 8 10 12 14 16
1 7 2 7 3 7
To carry out this plan you should write 4 and 7 as the next two numbers, thus:
1 7 2 7 3 7 4 7
- (e) sky—blue::grass—table **green warm big**
Here the thing to do is to underline the word that is related to "grass" in the same way that "blue" is related to "sky." Blue is the color of sky. Therefore, **green** should be underlined, because the color of grass is green, thus:

In a department where the job specifications indicated need for average intellectual ability in addition to skill, workers with low mental test scores and those with high test scores both showed higher turnover rates than those with intermediate test scores. In another department both average and

- sky—blue::grass—table **green warm big**
Monday—Tuesday::January—year **November Sunday February**
Tuesday comes next after Monday. Therefore, February should be underlined, because it comes next after January, thus:
Monday—Tuesday::January year **November Sunday February**
- (f) People hear with the **eyes ears nose mouth**
Here the thing to do is to decide which of the last four words makes the sentence a statement of fact, and underline it, thus:
People hear with the **eyes ears nose mouth**
When the signal is given, begin at top of the next page and work through the remainder of the booklet.
Work rapidly. If you are not sure about something guess at it, and go on to the next thing. There are no "catch" questions.
Do not ask questions. You are at liberty to refer to the directions at any time, but to do so oftener than necessary will waste time.
You will be allowed fifteen minutes. You probably will not be able to finish in the time allowed, but do as much as possible.
Do not skip about. Items skipped will be counted wrong. Do not turn over the page until the signal is given.
Begin Here!
(1) How many are 50 tents and 8 tents? **Answer ()**
(2) white—black **same—opposite**
(3) bird—sings :: dog—fire **barks snow flag**
(4) dogs meat cat **true—false**
(9) 2 3 4 5 6 7
(11) The Merino is a kind of horse sheep goat cow
(178) cardinal not cultivated virtues the be should **true—false**
(179) 4 8 10 20 22 44
(180) pertinacious—obstinate **same—opposite**
(181) advice—command :: persuasion—help aid **urging compulsion**
(182) A commission house which had already supplied 1,897 barrels of apples to a cantonment delivered the remainder of its stock to 27 mess halls. Of this remainder each mess hall received 56 barrels. What was the total number of barrels supplied?
Answer ()
(183) A five-sided figure is called a scholium pentagon parallelogram trapezium

Figure 1