



# Science News-Letter

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PSYCHOLOGY

## Science Helps Uncle Sam Pick Postal Aids

By EMILY C. DAVIS

For five years, Uncle Sam, the nation's biggest and most conservative employer of labor, has been quietly testing psychological tests as a means of selecting government workers. For five years, very little has been said about progress or results.

Dr. L. J. O'Rourke, who has directed the research necessary in order to apply psychological principles to the selection of employees, has been too busy studying government jobs and fitting tests to them to do much talking.

But even a busy and conservative psychologist will agree that perhaps after five years of steady progress the time has come to talk of saving time and money—and of psychological tests.

So he talked about his work the other day. And as he talked, four points stood out impressively.

First, it is a fact that the new tests are enabling the government to obtain more competent workers for given jobs.

Second, tests are more definitely related to the duties which are to be performed; that is, they more truly measure the abilities and aptitudes essential for the performance of the duties of the positions for which the applicant has applied.

In the third place, it has been demonstrated by this time that the new tests are saving the United States considerable money each year. Some one at the Civil Service Commission started to figure this up once, but the financial statistics applied to thousands of appointments and thousands of examination papers began to resemble a war debt before he got very far. He preferred to leave the situation with the general statement: "The efficiency of those

selected for the government service involves millions of dollars."

The fourth point is that with the new tests the task of scoring examination papers takes much less time than it does with the old style examinations. To make the eligible lists available as quickly as possible is of advantage to all concerned. The competitor wants to know as soon as possible whether or not he passed. The department which needs the employees wants to make the appointment with as little delay as possible. When the list of eligibles is made up quickly, there is less danger of the good man's losing interest and taking some other position. Now, in some of the examinations where objective tests are used, results are recorded and lists of eligibles are made available in about half the time formerly required, sometimes within a few days.

And the task is only begun, for the application of the new type examinations has not been extended to all the government positions where they may be serviceable. Furthermore, the commission plans to make each competitor's examination mean much more than simply that the competitor is eligible or is not eligible for the particular position for which he took the examination.

A timid person, if introduced to the mazes of government office machinery and told to see how he could improve the employment system, would doubtless start cautiously with some such branch as the Railroad Labor Board, which has less than 70 employees. Dr. O'Rourke started with the biggest piece of the government payroll, the postal service.

*(Just turn the page)*



UNSCRAMBLING THE CONTENTS of the mail sack, at the rate of 1,300 letters per hour.

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### Helps Pick Postal Aids

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The business of handling the United States mails requires over 300,000 workers, which is more than half the classified Civil Service list. To keep this huge force of employees up to the effective working strength means appointing over 15,000 new people each year for this one type of work. The announcements made from time to time that the government needs postal clerks and letter carriers attract 80,000 persons a year to present themselves for a test of fitness for these two positions alone.

Now, the old method of testing an applicant who wanted to carry letters or sort mail into sacks was to give him an educational quiz. This showed his ability to spell. It revealed whether he remembered enough arithmetic to satisfy the nation as to his ability in this direction. It showed whether or not he could organize his thoughts well enough to write a sensible and grammatical letter. The theory was that a man who had acquired this much education and carried it about with him on tap must have the ability to learn the postal business. Until psychologists began to analyze jobs and mental processes closely, the educational test was the best yardstick available when several thousand applicants had to be measured up to a standard.

Dr. O'Rourke's first step was to study the exact operations performed by men working in city post offices and on mail trains.

"I found," he says, "that the men who sort mail must memorize complicated distribution schemes involving 2,000 to 5,000 city names. And the difficulty is increased by the fact that they must keep in mind constant changes in the distribution scheme.

"In order to become proficient  
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### News-Letter Features

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## Helps Pick Postal Aids

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in this work, a man must not only be able to memorize the schemes, but he must be quick and accurate in reading addresses, and must distribute mail without the slightest hesitation as to the compartment into which it is to be thrown. The rapid distributor seldom, if ever, looks into the box into which he throws the mail. When he sees the address on a piece of mail, his hand moves automatically toward the proper box while his eyes focus on the next address. We timed the men and found that the average clerk when working at normal rate, distributes approximately 1,300 letters per hour."

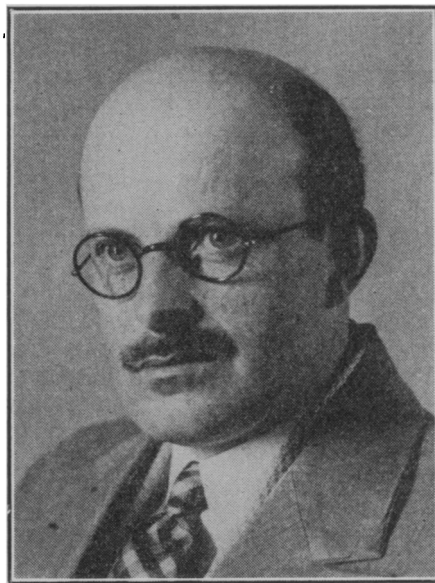
The psychologist talked with postal officials. He also talked with distributors, from substitutes recently appointed to veterans who have been shooting letters into boxes for thirty years. Then he proceeded to devise an examination to show whether or not a man would be good at that particular job of distributing mail.

This examination, which has now been taken by some 200,000 individuals who want this type of position, is a good example of the objective employment test.

If a mail distributor cannot memorize and distribute with a fair degree of speed and accuracy, he is certainly doomed to failure in this kind of work, though he might have a successful career in a different line. So, one part of the distributor's test gives the applicant a chance to test himself in this respect. He is allowed ten minutes to memorize a scheme of sorting mail for 30 cities. He is then told to read through a long list made up of these same names in different arrangements and to indicate the number of the box into which mail for each city should go. It is permissible to refer to the original chart of the scheme, but this takes time and cuts down his speed in marking the cities.

Another test shows whether the candidate can follow directions. In this test, he is set to work to make certain changes in a mail sorting scheme. Again, he is confronted with the exact sort of material and the same sort of problem that the post office work involves.

Another of the tests studied in the first research program required the applicant to decipher some addresses in rather cryptic handwriting, such as occurs on thousands of



DR. L. J. O'ROURKE, who directs the task of making up-to-date tests for government jobs.

letters trustingly dispatched to the post office every day. The purpose of this test was not simply to measure ability to read illegible handwriting; the test was constructed to measure ability to make comparisons and reason from the writing in one part of an address to that in another.

And last of all, or rather first of all, the candidate has to go through the modern substitute for the old ordeal of the educational test. That is, he must fill in the correct answers to a series of items designed to show whether he has sufficient of the more general abilities to meet the needs of the position. This is a relatively simple test of judgment and of ability to read accurately and interpret correctly posted directions, and to reason. The items are all devised so that they can be answered by one word or number. The following examples will show that the government's tests of this sort do not admit much lucky guessing:

Write the *number* of the *best* answer on the line at the right.

The business of mail-order firms has been greatly increased by the introduction of (1) special delivery (2) parcel post (3) postal savings (4) airplane mail (5) lock boxes.....

(Reading) "To obtain the best results in the Post Office there should be a certain uniformity in work and equipment. To produce this uniformity all conditions must be standardized. The service must be viewed as a whole and every detail must be accommodated to the uniform principles governing the entire service."

The quotation indicates that postal work should (1) be evenly distributed (2) yield better results (3) be governed by one man (4) be done by mechanical devices (5) conform to one

general plan.....

Letters are delivered promptly by the post office so that the (1) office can be closed on time (2) inclosures will not be lost (3) mail will not be heavy (4) letters will not be damaged (5) public may not be inconvenienced.....

Tests of this sort are deceptive in that they look as though they could be devised almost as quickly as they are answered. But to evolve a battery of tests so that the most promising applicants of the lot will carry off the highest scores is not so easy. Dr. O'Rourke tested his tests by giving them first of all to a number of distributors at post offices. These men included both those who were the best distributors and those who were the poorest, but their relative ratings were not known by Dr. O'Rourke until after the test scores were reported. The object of the trial was, of course, to select the tests on which the men who distributed mail most rapidly and accurately would make the highest scores and those who distributed slowly and less accurately would make low scores. After some minor revisions the tests which worked that way were combined into the examination.

So the tests for the distributors and also for postal clerks and carriers were completed and put into use. But even then they were on trial. After a year of the use of the new system, the postal officials made an investigation as to the efficiency of the men appointed during the year.

This investigation showed that men selected by these tests not only are better qualified to do the work than those selected previously, but that because of their special ability for this work they are more satisfied in doing it.

The same sort of job analysis and test designing has been applied to junior engineers in the government during the past three years.

A blue print is presented to the engineer and he is asked to pick out four of the five essential points, following specific directions. If he knows the principles he can do it. The tests are now more quickly and accurately graded, besides differentiating better between the ability of candidates than previously.

The applicant is also given actual problems of stress and strain and construction. His solution of the problem shows whether he can plan and reason, as he will have to do in actual working conditions.

(Just turn the page)

## Helps Pick Postal Aids

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Dr. O'Rourke's tests work because he believes that evolving the tests is a problem in human engineering. It is never a mechanical application of formulas. Even though thousands of the test items must be prepared, every one must contribute its share toward picking the right man for the job.

Besides proving their ability to predict success and failure of job candidates, the tests have other interesting advantages to their credit.

The person who asks about one of these new examinations is given samples of the tests, with directions exactly like those which will be given in the examination. The commission does not want competitors to think that they are going to be confronted with some mysterious examinations, and feels that the best way to avoid this is to tell the applicants exactly what the examination is like.

This distributing of samples serves to increase the value of the examinations, however, as well as to relieve the competitor; it insures that the examinations measure ability in the tests which are being given and not the amount of information secured from others who have taken such examinations previously. In the case of the mail-sorting tests, the announcement which gives a sample of the test also suggests to the applicant that he might devise a few similar sorting schemes for himself and practice on them.

Another advantage of broadcasting samples of the examination as part of the announcements is that the samples often give the applicant a glimpse of the actual work involved in the job. If the sorting tests, for instance, seem to him particularly nerve-racking and difficult, he can foresee that he would not be likely to find the work congenial even if he were to obtain a good rating in the test.

In the government's employment office, the new tests have greatly reduced the work. The enormous amount of time needed to correct great numbers of compositions, arithmetic problems, and other examinations has already been referred to. For rating the new tests, a card showing the list of answer words is placed beside the candidate's answers—the words that correspond are right.

But psychology goes much further than this in devising short cuts to

the rating of competitors. After a large number of individuals had taken the new tests for postal clerks and carriers, the scores were analyzed. Dr. O'Rourke found that a competitor who makes as low as 60 per cent. on the first part of the test will not make enough on the rest of the examination to bring his rating up to a passing grade. The actual figures are that one-half of one per cent. of those individuals who get less than 60 on the first part do manage to scrape through with a passing mark. But since only about the highest 25 per cent. of all those who take the test have a chance of being appointed, the individuals included in that one-half of one per cent. will never receive appointment.

With these figures before them, the examining division announced that all papers that fell as low as 60 on the first part of that examination could be discarded without further correcting. In one examination in which 25,000 persons passed in papers, this saved the time required to rate 8,333 papers. Any teacher who has corrected school papers night after night, will easily picture these 8,333 papers that did not have to be corrected. Moreover, this saving was in the correction of the short-answer tests, which were already much more rapidly handled than were the tests previously used.

Altogether, the examining division figures that it takes a little less than half the time to rate short-answer tests that it took to rate the old style quizzes. And the cost of administering the new tests is 40

per cent. less than the cost of administering the old.

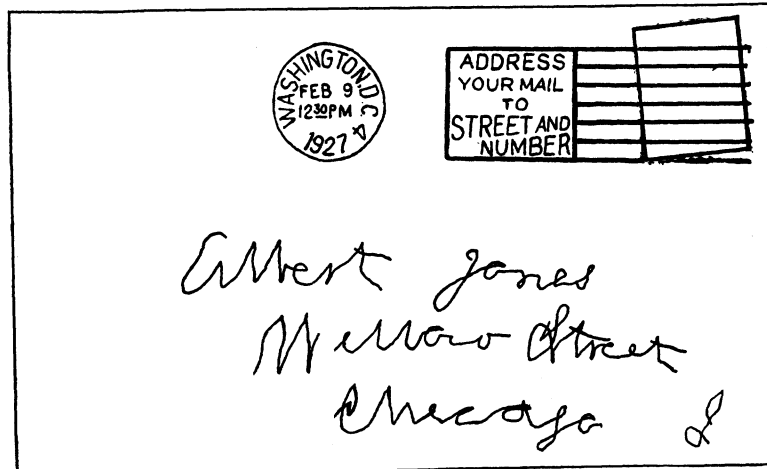
The saving cost and time will increase as the test system gets into full swing, it is explained. The examination staff is collecting a file of items used in each general adaptability test. Each item that can be used again is filed on its own card, marked with its record to show when it was used and how valuable the item was in the selection of applicants.

In three or four years, the files of the commission will be sufficiently stocked with test material so that it will be necessary to make but very few, if any, new general adaptability test items. A new test can be made by merely fitting together a new assortment of the old items. Since the government started this method of preserving its tests for future use, some universities are introducing the same method for their entrance tests.

The government's employment office has always been considered a highly conservative organization. It still likes to be so regarded. Nevertheless, in the opinion of Dr. Walter V. Bingham of New York, director of the Personnel Research Federation, who specializes in employment efficiency, the government is setting a pace for business in its application of modern science to employment problems.

"Large business concerns," says Dr. Bingham, "will not be slow to follow the government in carrying forward similar scientific investigations, to bring about economies in efficient selection of their personnel."

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IF YOU WERE A MAIL SORTER IN CHICAGO, to which street would you direct this letter—Minaw, Mencro, or Willow? The street name begins with either "M" or "W." The second letter may be either "i" or "e," though it is more like the "i" in Chicago than like the "e," in Jones. Comparison of the next letters with the "l" in Albert and the "n" in Jones indicates that "ll" is intended. The address therefore is most probably Willow Street.