



SEA'S CHALLENGE MET IN LABORATORY

PSYCHOLOGY

Engineering Methods Aid In Study of Workers

ENGINEERING methods applied to the study of human beings that enabled one plant to reduce its labor turnover from an expected range of 30 to 60 per cent. to only 6 per cent. per year, were described by Dr. Harvey N. Davis, president of Stevens Institute of Technology, in an address under the auspices of Science Service in New York.

"For years you have been fussing over your raw material specifications that were already good enough," Dr. Davis quoted an engineer as having told the industrialist in charge of the plant. "At the same time, you've been spending more each year on labor than on all your raw materials put together and spending it as blindly as if human beings were neat little packages of some thoroughly standardized product that needed no investigation beyond looking at the label."

The industrialist was impressed and put the engineer right at work on human investigation in his plant.

The chief difficulty in the way of such a study of human beings, Dr. Davis explained, is the fact that no two humans are exactly alike. When a metallurgist studies a piece of copper, he knows that what he finds out will apply not only to this individual piece but to all other pieces of identical specifications. No two human individuals that walk into a laboratory are ever exactly alike.

This difficulty can be in part overcome by the use of statistical methods. Al-

though the individual may be unpredictable, still study of a large group will give results that will apply to other large groups selected similarly.

"Another basis for the scientific study of human beings is that we seem able to separate out of the infinitely complex mental make-up of individuals, a number of independent powers of abilities or aptitudes that can be measured and studied each by itself," Dr. Davis said.

Two simple tests developed by the engineer for use in selecting girls for factory work were cited by Dr. Davis as examples. One was a finger dexterity test. The girls were required to pick up pins, three at a time, and put them quickly into holes in an aluminum slab. The other test required the doing of practically the same task by the use of tweezers instead of the fingers.

The factory had always worked on the assumption that these two abilities, which seem so similar, were in fact identical. After a girl had been trained and become proficient on the finger work, she would be transferred to the tweezer job.

Testing revealed the surprising fact that the two abilities are entirely different. The best finger workers stood no better chance of being good tweezer workers, therefore, than any that might be picked from the poorest finger workers or selected at random from the employment office.

Science News Letter, August 17, 1935

ENGINEERING

Miniature Ocean Tests Concrete Resistance

A FEW minutes' drive from Chicago's sweltering business section, sea breezes blow and cooling waves throw up a salty spray, with not a bather or a bronzed life-guard in sight.

Unfortunately for heat-stricken citizens, the "ocean" is in the research laboratories of the Portland Cement Association, where the action of sea water on concrete is being studied.

Contained in two eleven-foot tanks of concrete is water, just like sea water, only four times as concentrated. Electric pumps stir up the "waves" and cause them to break against miniature cement piles, similar to those that hold up the piers at the seashore.

Here the tide takes twice as long to come in and go out as in the natural ocean, for it is high tide in the tanks alternately every twenty-four hours. Engineers decided that the longer period of immersion and drying would be a more severe test to the concrete than a natural twelve-hour cycle.

The concrete piles are of varying quality, and the depth of penetration of the "sea water" is checked daily by extremely accurate electronic meters. "Tides" rise and fall exactly one foot.

The tests will be carried on for years, and engineers expect to obtain precise data on the destructive effect of sea water on concrete, which will enable them to secure a longer life in concrete used in sea-water construction jobs.

Science News Letter, August 17, 1935

BIOCHEMISTRY

Pellagra-Preventing Vitamin Suspected of Being Twins

ARE SCIENTISTS on the way to the discovery of another vitamin? Experiments reported by Drs. Albert G. Hogan and Luther R. Richardson of the Missouri College of Agriculture indicate that vitamin G—the one which must be attained by the body if pellagra is to be prevented—may have a plural nature.

Vitamin G, it is recalled, is a separate factor formerly considered part of the original vitamin B. Prof. E. V. McCollum, of the Johns Hopkins University, in 1925 discovered, however, that vitamin B really was composed of two types, called vitamins B₁ and B₂ abroad, or B₁ and G by American scientists. In 1926 the late Dr. Julius Goldberger and his collaborators at the U. S. Public Health

Service identified vitamin G as the pellagra-preventing factor.

Now vitamin G, in turn, may need to be broken down into separate parts. Various experimenters have been having difficulty in checking each other's work in vitamin G studies, and it has been suggested by Drs. Hogan and Richardson that the confusion is due to the existence of at least two different deficiency diseases, related to the vitamin B complex.

One disease is a severe form of skin irritation, or dermatitis. It was created by Missouri scientists by feeding rats a source of vitamin B which has been intensely radiated with ultraviolet light. After developing the dermatitis, the rats died.

The second disease was one in which experimental rats lost all their hair, became miserable in appearance and finally died. It was caused by feeding the

rats a source of vitamin B called tikitiki, an alcoholic extract of rice polishings.

The denuded type of disease was cured, the scientists report, by feeding the rats flavine.

Wheat germ oil cured the dermatitis type of disease, but flavine would not do so.

Describing the two different types of disease and the means of curing them, Dr. Hogan said:

"These additions to our knowledge should help the biochemist in deciding whether other vitamins exist. They should help the clinician in deciding the relation between vitamins and pellagra, and possibly between vitamins and other diseases."

The experiments of Drs. Hogan and Richardson have been published in the British science journal (*Nature*, Aug. 3).

Science News Letter, August 17, 1935

DIETETICS

Spinach Over-Rated As Source of Iron

SCIENCE is coming to the defense of the youngster who refuses to eat his spinach.

Mother, it seems, is only partly right when she pleads with Junior to "Eat your spinach—it's good for you."

It's good for him, but not nearly as good as it's been cracked up to be. It just can't be spinach that enables Pop-eye the Sailor to perform all those red-blooded feats in the movies. For spinach contains iron, but—

New studies at the University of Wisconsin, carried on in those agricultural chemistry laboratories which have already made countless contributions to the knowledge of vitamins and minerals, show that only 25 per cent. of the iron in spinach is "available," as scientists put it. That is, only one-quarter of it is in a form that is usable by the body. Other vegetables are no better than spinach in this respect.

A higher proportion of the iron in meat is available, according to the Wisconsin investigators. More than 60 per cent. of the iron in heart muscle and liver—both of beef and pork—is usable for blood-building. In ordinary beef the proportion is 50 per cent. In oysters it is less than 25 per cent. The iron in cereal breakfast foods and grains is also only partly available.

It must be remembered that these figures represent only the *proportion* of the

total iron which is available. Any attempt to rate foods in the order of their value as iron carriers must consider also the *total amount* present—in fact, the latter is the only criterion that has been used in the past. New information will now make it necessary for nutritionists to revise present standards.

Some of the present revelations regarding iron in foodstuffs are of significance to farmers and stockmen interested in livestock feeding. The iron in soybeans was found to be 60 per cent. available, and that in alfalfa and blood, 25 per cent.

Investigations on the availability of iron were simplified by the recent development of a chemical for making this determination. The foregoing results were secured by this means and then checked by feeding trials with anemic experimental animals.

Not only iron, but also copper is needed for building blood hemoglobin. Wisconsin scientists are now investigating whether it, like iron, varies in its availability. So far the only food on which complete results have been obtained is wheat. It was found that the iron in this grain is readily available.

Science News Letter, August 17, 1935

So-called Damascus steel blades—watered steel—were produced not merely at Damascus but throughout the East.

ORNITHOLOGY

Mockingbirds Are Upholders Of Property Rights

MOCKINGBIRDS, like most songbirds, are not communists. They recognize definite property rights, and will fight vigorously to defend them, if necessary.

Mockingbird landholding customs have been carefully studied by Harold Michener and Josephine R. Michener of Pasadena (*Condor*, May-June, 1935).

When a male mockingbird in spring finds a suitable place for bringing up a family, he posts himself at a prominent point and by loud singing notifies all comers that he has staked his claim. Would-be claim-jumpers of his own sex are promptly attacked and routed. When he is joined by a female and takes her for his mate, the territory he has chosen becomes the source of the family food supply for that breeding season. The male continues to defend it, the female taking no part in his fights in defense of the home territory, but devoting herself to her maternal affairs.

But after the young ones are raised and the nest abandoned, both birds select a winter feeding territory, which often includes the nesting area but usually has wider boundaries. This they defend together, the lady being no less pugnacious than her mate if an intruder tries to forage in it.

Boundaries, once established, are usually recognized by the birds on both sides of them; though some individuals are less careful about respecting their neighbor's property rights than are others, and have to be chased home frequently.

Science News Letter, August 17, 1935

PSYCHOLOGY

Reading Improves Spelling, Even for Words Not Read

IF YOUR boy is a poor speller, reading will help him to overcome this fault. Tests of 380 men and women college students show what improvement in spelling follows reading. And surprisingly enough, the improvement extends to words not included in the matter read. The tests were made at the University of California by Dr. Luther C. Gilbert.

Reading slowly does not give any advantage in the matter of spelling improvement, the tests showed. No significant differences were found in the reading rates of those who improved greatly and those who showed little progress.

Science News Letter, August 17, 1935