

word it represented—somewhat the problem faced by the stenographer when she learns shorthand. Dr. Bartlett used the interesting word signs of the American Indians. When his subjects had memorized the signs, he gave some dictation. They were to write words until they came to one for which they knew a sign when they would use the sign.

Personality Enters In

Here again personality entered in. For signs were remembered that fitted into the subject's previous experience—that seemed to him to have significance. You might remember the sign for time, if you happen to know it resembles a certain type of primitive sun-dial. The sign for eye was easily remembered because it is a fairly good representation of a human eye. The sign for word was most frequently forgotten because it was merely a wavy line. Flash was remembered because it resembled light-

ning, but later recalled as the sign for the word lightning.

Signs are remembered also when they please the individual or amuse him.

They are forgotten when he says to himself, "I will make a special effort to remember this sign."

But the final experiment was the most interesting, for it shows how stories become distorted in the telling, or rather how they become fitted to the previously conceived ideas of the narrators—how history of the same events takes on such various forms in various nations.

An original folk tale was read by the first subject. But the second man, instead of seeing the original, saw the first man's version. In other words, it was just like that favorite old game of gossip, except that the intention was not deliberately to add to the tale but to reproduce it as nearly as possible as it was read.

Although the stories gain some ex-

traneous details, they lose much more than they gain. An exciting story of an air-raid became in the thirteenth reproduction as follows:

"I took the Bothams off the platform and put them into a carriage with the old ladies and some toys. I drove them to the station and put them in the train. The engine whistled four times. I strolled down the platform and turned in disgust."

Reduced to Nonsense

This last subject in the series naturally could make nothing out of the story but sheer nonsense. The "Bothams," which originally were a family the narrator was seeing off on the train just as the station became the center of a raid, had become some unknown and inanimate objects. For three reproductions only the story remained one of an air-raid, and in the fourth it might be suspected as that, although there was no mention of war.

Similarly striking changes occurred in the reproduction of a drawing from one person's version to the next. An ancient Egyptian "mulak" or conventionalized reproduction of an owl lost its characteristic elements in a few versions and soon became a very ordinary looking drawing not however of an owl at all but of a cat. After that following versions added details of curled tail, whiskers, ribbon, and pointed ears. Similarly a peculiar distorted futuristic sort of drawing of a face immediately in the first production assumed more correct proportions. Within very few reproductions it was a perfectly normal, conventional face.

Thus do we constantly modify all that we see and hear to fit in with the previous experience and traditions of our race.

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Full-sized reproductions of Indian homes and ceremonial buildings are to be built on a six-acre plot of ground in New York City, by the Museum of the American Indian, Heye Foundation.

Curiously, radio is helping to build a bridge. Special short wave transmitting and receiving sets make possible communication among groups of contractors scattered on land and water along the eight and one-quarter mile route of the bridge to Oakland, which is under construction. These men on the job also talk with the head offices and with the office of the state engineer in San Francisco.

GEOPHYSICS

Scientists Probe Deep Into Earth For Variety of Secrets

IT IS BECOMING more and more difficult for the earth to keep its secrets, even if they are buried far underground. Inquisitive miniature earthquakes, magnetism and electricity controlled by geophysicists at the surface are rapidly revealing the structure of the earth and the location of valuable mineral deposits hundreds and even thousands of feet below.

Within recent months more than a hundred groups of scientists scattered over the world have been making underground surveys for oil alone, it is revealed by Sherwin F. Kelly in a report to *Mining and Metallurgy*. Most of them are using the seismic method, setting up their own little earthquakes with high explosives and carefully studying the earth waves radiated by the shocks. Some are working with the torsion balance or pendulum instruments which measure minute differences in gravity. Others examine the effect of the earth on magnetism and electricity.

The electrical and magnetic methods are used to make the earth surveys to depths of 2500 feet, beyond which seismic apparatus is employed.

The site for the huge dam to be built at Grand Coulee on the Columbia river

was studied, and dam-site surveys in Algeria predicted a faulted condition of bedrock which has been verified by later exploration.

In dry Tunis, a geological formation is being studied so that artesian wells may be drilled in locations most likely to yield water. Magnetic methods were used to locate a needed road building material in Algeria.

Deposits of salt more than 700 feet below the surface in northern New York were studied with a new instrument, the ground comparator, invented by Theodore Zuschlag. This instrument, whose invention is credited by error to his associate, Mr. Kelly, in *SNL*, Dec. 23, '33, p. 410, is so sensitive that it will follow veins of quartz by making use of their electrical resistance which is greater than that of rock enclosing them. It is now being used for this purpose in an electrical survey in a gold-bearing district near Augusta, Ga.

A valuable new instrument has been developed at the Michigan College of Mining and Technology, Mr. Kelly pointed out, and this college and the Colorado School of Mines are carrying on important research to improve geophysical prospecting methods.

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