PSYCHOLOGY

Curious Memory

Remembering Largely Matter of Reconstruction, British Psychologist Concludes After Research From a New Angle

By MARJORIE VAN DE WATER

"I'LL NEVER forget the time when—" and Uncle George is off on another of his reminiscences. And all his nephews and nieces and most of the neighbors that happen to be in the audience wonder why in the great wide world Uncle George should have remembered that particular incident—why he can't forget it after all these years. Especially does it seem curious when you think that Uncle George is the most forgetful person around—never knows where he left his glasses, or whether he fed the cat, and sometimes has been known to walk all the way back home from the store before he could recall what he went there for.

Memory is one of the most curious actions of that mysterious mechanism, the human mind. Psychologists have evolved many theories in attempts to account for it. They have studied it in various ways.

Now a British psychologist, Dr. F. C. Bartlett, of Cambridge University, England, has gone at the matter from a new angle. He has experimented not with ability to memorize poems, or nonsense syllables, or other material for purely rote memory. The material he used for the most part is the sort that you try to remember every day—the gist of a story you have heard, for example. And he has used a test like the old parlor game of "gossip" to see how whole groups forget some things and modify what they remember. You may try his tests yourself on your friends at your next party, with interesting and fun-provoking results.

All Kinds of Reasons

All sorts of things enter into the complex question of what you will remember and what you will forget. Your personal interests are important, your emotional attitude, your past experiences, and the meaning the situation has for you. But even beyond yourself, your memory is determined by the social group to which you belong.

For example, if your name is Kelly or O'Brien, you will probably find it much easier to rememebr how to spell O'Shaughnessy, with all its vowels and consonants, than Schajowicz or Koninklijke, even though they are shorter. Yet if you lived as one of another social group, it might be O'Brien that would be easily forgotten.

It is not difficult for the young man in America to remember which baseball teams played in the last World's Series, or the name of the present heavyweight champion. But if you have among your acquaintances an English youth, you will probably find that these matters very easily "slip his mind."

Remember Cattle Only

Dr. Bartlett found striking examples of this social influence on memory among the Swazi people. They are reported in his book on "Remembering," published by Macmillan.

The Swazis are a South African people widely reputed to have exceptionally wonderful word-perfect memory. Dr. Bartlett decided to verify this by scientific experiment. Various tests of memory given to the people failed until he asked a herdsman for a list of the cattle bought by his employer during the year previously, together with details of the sales.

The herdsman, who could not read or write, squatted unconcerned on the ground and rattled off the complete details of all his master's deals with names and prices. Checking showed that he was correct in nearly every detail.

The Swazis are a group remote and isolated from contact with other peoples, especially Europeans. Their interests are narrow, and most of their culture centers around the possession and care of cattle. Cattle is the big consideration of all the people there.

The Swazi herdsman has an extraordinary ability to remember details regarding cattle. In other matters his memory is no better than yours. This exceptional ability is due to the social pressure of the group.

If you think over your own chief interests and those of your particular group, profession, community, or "gang," you may discover the parallel to the Swazi's cattle in your own set of facts that you have special facility for remembering.

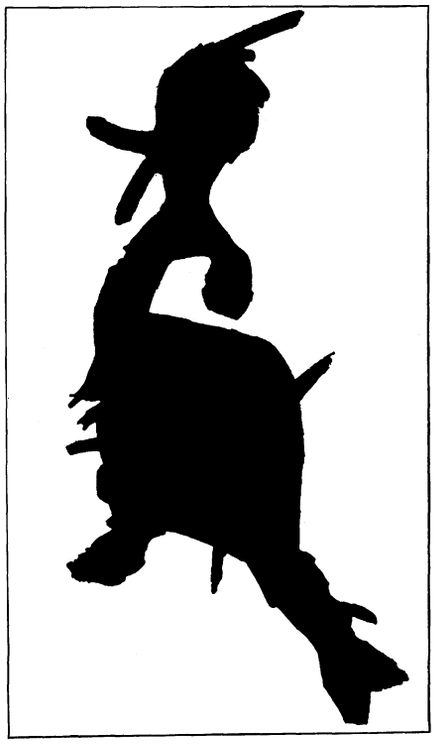
Dr. Bartlett's experiments help to reveal these.

He began with tests of perceiving, for after all, what is remembered of a scene or an event depends primarily upon what was "taken in" by the observer.

Beginning with very simple forms and leading up to complex scenes, Dr. Bartlett showed pictures to his subjects for a very short time and then asked them to reproduce or describe what they had seen.

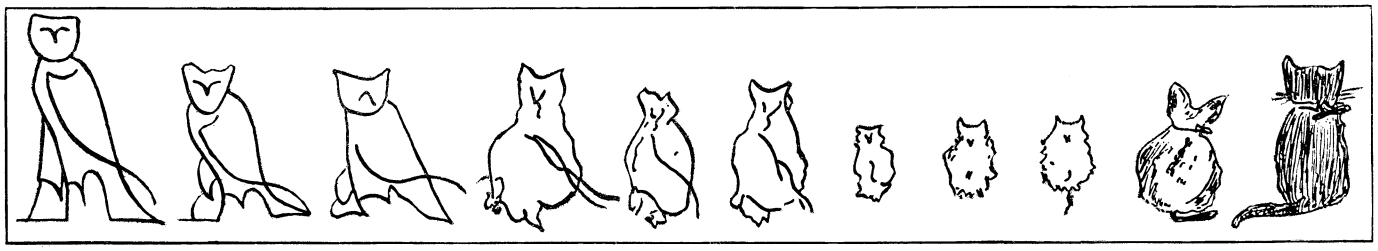
The time of viewing the picture was not long enough for study. The subject just had time for the brief glimpse that in everyday life you might have of an accident just as it is happening—not longer than a quarter of a second.

In that time the subject always gets a general impression of the scene or form before him, and generally some detail or details stand out with special clearness. Other things which the observer thinks he perceives are in reality



WHAT DO YOU SEE?

Ordinary ink blots became valuable tests of imagination, which is akin to memory.



RAPID EVOLUTION

The original sketch on the left represents an ancient Egyptian "Mulak" or conventionalized owl from which our letter M may have originated. Each reproduction was "remembered" from the one next at the left. The tenth was a commonplace cat.

built up—manufactured in his mind—from that initial impression.

One of the cards used by Dr. Bartlett brings this out clearly. It shows a plain geometric design somewhat suggesting the shape of an airplane. Below this design is the inscription "An Airoplaxe." Farther below and to the right is the outline of a hand pointing upward toward the "airoplaxe."

Correct Name Important

All but two of the persons tested said definitely that they saw an airplane, and all but one read the inscription as "aeroplane," the accepted spelling of the word in England where the test was given. One man saw the hand as an upraised cannon pointing at the aeroplane.

The details that you build up on your first general impression may depend upon the name you fasten to that impression. Some of Dr. Bartlett's subjects called one rather ambiguous form an anchor. These persons thought they saw long points on one and a ring in the other, although these details were not actually a part of the form. Others called the same form a turf-cutter and "saw" a smooth round blade. Only one man saw the blade correctly. He had named it a prehistoric battle-axe.

Imagination was tested in the next series of experiments for imagination and memory are closely related; both are the conjuring up of material out of the individual's past and applying it to the present situation.

As a test, Dr. Bartlett used something already utilized by psychologists to gain insight into personality and interests. It is something that you have available on your desk, in case you wish to perform some experiments yourself along this line. For what he used was merely a set of ink blots.

Drop a splotch of ink and watch the resulting fanciful shape, what does it look like? You may see almost anything in it. You will be amused at what your fancy will associate with these odd shapes. And the chances are you will see something entirely different from what anyone else in the world would see.

Dr. Bartlett laid a number of such blots before his subjects with the following instructions: "Here are a number of ink-blots. They represent nothing in particular, but might recall almost anything. See what you can make of them, as you sometimes find shapes for clouds, or see faces in a fire."

Dr. Bartlett was struck first with the enormous variety of the responses. The following diverse answers all originated from the same blot—believe it or not.

Irate lady talking to a man in an armchair; and a crutch.

Bear's head, and a hen looking at her reflection in the water.

Angry beadle ejecting an intruding beaver which has left footmarks on the floor.

A man kicking a football.

Lakes and green patches of meadow-land.

Scarecrow behind a young tree.

Tiny partridges newly hatched.

Animal pictures and the Crown Prince of Germany.

Smoke going up.

Why You Saw It

The interpretation is influenced by personal interests and attitudes, and also by the interests of those of the social group. Those seeing feathers, and bits of finery, and embroidery designs are for the most part women. One man, whom a blot reminded of "Nebuchadnezzer's fiery furnace," was a minister of religion. That same blot reminded a physiologist of "an exposure of the basal lumbar region of the digestive system as far back as the vertebral column up to the floating ribs."

So what you are reminded of, as well as what you "see" or perceive, depend on your personality, and upon your group.

What about remembering?

Dr. Bartlett's first test is another that you can easily try out for yourself. Take a group of five or six pictures of men's faces—a few clipped from this morning's paper will do very well. Let your friend look at them, one after the other following about ten seconds to each one. Then a half hour later ask him to describe them.

You will probably find that he can't do it accurately. He will clearly remember some striking details, such as a mustache or peculiar glasses. But like as not he will place them on the wrong man. But you may notice another peculiar tendency. If one of the men is in uniform or otherwise shows his type, your friend will very likely describe, not the face he has seen in the picture but the face he has learned to associate with that type.

One of the pictures Dr. Bartlett used was of a British soldier—a "Tommy Atkins." The observers described a heavy set man in a trench hat and with coat collar turned up—all details completely lacking from the photograph they had seen.

He had his subjects read short tales somewhat like the old Aesop's Fables, but these were taken from the Folk tales of the American Indians and other primitive peoples. He asked them to repeat them, first after about 15 minutes and then again and again after long and longer intervals.

In long-distance remembering of tales, two things seem to persist. First the general setting, the atmosphere, or the reader's attitude toward the story and second, one or two isolated striking details. All the rest of memory is re-construction from those two starting points.

All the unfamiliar proper names were lost or became modified so as to sound more usual, and other details were similarly conventionalized. Canoes became boats, arrows became "arms" and supernatural or other bothersome details were modified so as to be understandable.

The next experiment was in remembering of a different type of material. The association of a word sign with the

word it represented—somewhat the problem faced by the stenographer when she learns shortland. 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 lightning, 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 extraneous 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.

Science News Letter, March 24, 1934

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.

Science News Letter, March 24, 1934

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.