

PSYCHOLOGY

Whole Brain Not Needed For Handling Money

Experiments With Apes and Monkeys Show This Ability Is Retained After Loss of Frontal Association Area

YOU DON'T have to have all your brains to handle and use money.

This is the conclusion that might be drawn from experiments with the famous monkeys and apes at Yale who have been taught to earn varicolored poker chips and then spend them for food delivered to them by automatic vending machines.

These "financier" apes and monkeys have aided in a new experiment, designed to explore further the mechanism of the brain. Drs. C. F. Jacobsen and J. B. Wolfe of Yale's Laboratories of Comparative Psychobiology have reported that even after injury has deprived the apes of what the scientist call the frontal association area of the brain, they retain some of their financial ability.

They can earn money. They can distinguish valuable "coins" from worthless ones. They spend their wealth for food at automatic vending machines appropriately called "chimpomats."

Could Go On Spending

A financier or banker so unfortunate as to suffer a lesion of his frontal association brain area might be able to go on as usual spending his money. The ability to recognize the value of money and to exchange it for valuables is one which survives even in the face of a lack of this important part of the brain. But he might easily be cheated. For like a young child, he might not know

the difference between nickels and dimes. The injured banker would suffer a loss of memory of events in the immediate past, it appears from Dr. Jacobsen's experiments on primates, which were conducted with his associate, Dr. Wolfe.

The animals were allowed to watch the experimenter hide a coveted morsel of food or a "coin," which they could later exchange for food, under one of two cups. If they were released immediately, they would practically always go immediately to the correct cup and secure the reward. But if they were held in check for even so brief a time as two seconds, they would have forgotten which was the right cup. Healthy animals can remember where to look for as much as five minutes.

Similarly, the injured animals were able to reach out of their cages, secure a stick for a tool, and with it draw in a banana which lay temptingly just out of arm's reach. More than that, when the treat was farther away, they could use the stick to reach for a longer one and then make use of the longer stick to get the food. But when the food was placed outside one end of the cage and the stick outside the other end, the problem was too much for them. They could not keep in mind the location of the food long enough to go to the other end of the cage for the stick.

Nevertheless, the memory of how to

use the stick, and how to perform the complex trick of taking a coin and placing it in a slot machine to secure food, were retained. The apes were even able to select a yellow chip which would buy them a piece of food in preference to a green one which was the "lead coin" of the experiment and had no exchange value. They forgot, however, a previous ability to choose a red chip which would buy two pieces of food in preference to the yellow one with half the value.

The association area of the frontal lobes of the brain is thus shown to be essential to the ability to keep in mind more than one aspect of a problem while handling them to obtain a solution, and necessary for memory of events of the immediate past, Dr. Jacobsen concludes. The memory of long past events and well-learned habits are retained even after the loss of this brain area.

Like Aged's Loss of Memory

The situation of the injured animals is somewhat parallel to that of the old persons suffering through senility from "loss of memory." Reminiscences of early childhood and ingrained habits are often retained very well indeed, although the person can not recall what day of the week it is or where he laid down his spectacles just a moment ago.

The results indicate clearly a division of labor among different parts of the brain in primates. In this man and his nearer relatives differ from the lower animals such as rats.

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THEY DON'T NEED ALL THEIR BRAINS

These apes were taught at Yale University to select a "coin" with exchange value from among worthless ones and to spend it in an automatic vending machine. New experiments have shown that this ability is retained even after loss of the frontal association area of the brain.

