

## GERONTOLOGY

# Unlearning Is Problem

**Jobs that require new techniques become progressively harder for those over 30 to learn to do satisfactorily, suggesting that tasks requiring speed and unlearning are unsuitable.**

► A BIGGER PROBLEM for older people who want to go on working is not learning new things so much as unlearning things that they have learned in the past.

Studies showing this have been made by Dr. Jack Botwinick, psychologist of the Clinical Center, National Institutes of Health, Bethesda, Md.

If what you have been doing is unlike what you are going to do in the future, you will have to unlearn a good deal of what you have been doing, Dr. Botwinick pointed out. This problem of unlearning, which is the biggest problem of learning new things, is true even at 30 and more so at ages 40, 50, 60 and on into the higher ages.

A person past 60 can do well on his own until he gets to a late age, but if there is increasing management policy for automation, for example, requiring the man to learn something new for his job, unlearning what he was doing very well may be the biggest problem.

A more familiar example that Dr. Botwinick gave was that of an older person learning to drive a non-gearshift automobile. He can do it, but it takes longer for the older person to stop reaching for the clutch than for a younger person learning the same thing.

A process of adaptation is related to the process of learning and unlearning. What has been adequate and appropriate at one time, but is no longer so, must be eliminated. The older the person, the harder it is to eliminate inappropriate or inadequate behavior, because, again, it involves an unlearning process.

Implications of the situation's social aspects are that older people should be able to do well if they continue doing what they have been doing, in the way of a job or other activities.

This is particularly true if the older person is a superior person, and if what he does involves verbal material.

For example, a person who works in teaching, unless he has to learn new processes and new methods of teaching, should be able to go on doing a good job as he gets older, whereas a person whose work involves manual or other kinds of physical activity may have more difficulty as he gets older.

Every living creature gets slower as he gets older, man is not the only animal that slows down with age, Dr. Botwinick said.

The group studying the aging process at the Clinical Center think the slowing is not only a question of muscles and a nerve reaction, but also a matter of the thinking

process, as well as of complex behavior and skill.

This means, Dr. Botwinick said, that jobs requiring speed and unlearning are not suitable for older persons, whereas jobs requiring accuracy and recurring repetitive processes are work at which older people will do relatively well.

Science News Letter, February 4, 1956

## TECHNOLOGY

## New Transistor Operates At Very High Frequencies

► A NEW TRANSISTOR that operates at frequencies three times higher than others recently announced has been developed.

Because of its very high frequency characteristics, the transistor is expected to be widely used in guided missiles and electronic "brains."

Heart of the tiny amplifying device is

the center layer, or "base," which is only 50-millionths of an inch thick.

It is made at Bell Telephone Laboratories in New York by a new fabricating method that uses the process of diffusion to control minute amounts of impurities sandwiched onto the base layer.

The narrower the base layer can be made, the higher the frequency at which the transistor will operate.

Transistors are widely used to replace vacuum tubes as low-frequency amplifiers, and the newly developed device broadens their field of application to include both black and white and color television transmission as well as missiles and computers.

Experimental units of the new device have amplified by 100 to one currents across a band 20,000,000 cycles wide. Either amplification or the number of communication channels can be made three times that of other transistors. When the frequency band is cut in half, power amplification is doubled. Available transistors have a frequency cut-off of up to ten megacycles, while the new ones work to 600 megacycles.

C. A. Lee of Bell Laboratories perfected the techniques of sandwiching with germanium. C. S. Fuller and M. Tanenbaum have applied the diffusion technique in making the new transistor from silicon. Dr. William Shockley and George C. Dacey directed the work leading to the development.

Science News Letter, February 4, 1956



**MAKING TRANSISTOR BY DIFFUSION**—Electrical contacts are being made to germanium by vaporizing a metal onto the surface, using the process of diffusion to control the amount of impurities. The germanium bar is under vacuum in the jar while a Bell Telephone Laboratories technician performs one of the operations in making the new transistor, which shows great promise for use at very high frequencies.