MEDICINE

Honor for Brain Findings

Nobel Prize in medicine honors scientist who discovered the sanity-restoring brain operation, and researcher who discovered brain stem role in sleep.

DR. EGAS MONIZ

➤ BETWEEN 7,000 and 8,000 mental patients in the United States have had the sanity-restoring brain operation "first conceived and executed" by Dr. Egas Moniz, Portuguese medical scientist who shares this year's Nobel Prize in physiology and medicine with the Swiss brain researcher, Dr. Rudolph Walter Hess.

Dr. Hess is known for his discovery that sleep can be induced by electrical stimulation of part of the brain stem known medically as the hypothalamus and sometimes popularly called the seat of the scul. His studies showed that this particular region of the brain has an active role in bringing on sleep and also in promoting the unconscious activities relating to growth and body nourishment which go on during sleep. Dr. Hess is director of the physiological institute of the University of Zurich.

The operation Dr. Moniz devised is known as prefrontal lobotomy. It consists in cutting connections between certain cells in the front part of the brain. The idea of destroying something in the brain to help a patient with a disordered mind came to Dr. Moniz while attending a conference in London on defects that resulted from injuries of various kinds to the brain.

The number of cells in the brain is fixed and they show no change in mental disorder. The connections between the cells, however, are changeable and are extremely variable in the normal person. In mentally sick persons, Dr. Moniz reasoned, these connections are stabilized in an abnormal way. Ideas of persecution, delusions, anxieties develop and persist. Disturbing the brain connections, he thought, would free the patient from his morbid mental activity.

Before developing his brain operation, Dr. Moniz had developed a safe way of making the brain's arteries visible in X-ray pictures.

During and after the first World War, Dr. Moniz turned from medical research to serve as his country's foreign minister. His scientific work was interrupted again in 1939 when a homicidal maniac pumped six bullets into him.

His brain operation was first introduced into this country by Drs. Walter Freeman and James W. Watts of George Washington University, Washington, D. C.

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MATHEMATICS-ENGINEERING

No-Slip Library Machine

Mechanical librarians must be "fail-safe" to prevent information being missed. Need a device to insure more information rather than less in event of failure.

➤ ELECTRONIC mechanical librarians of the future must be "fail-safe" if scientific progress is not to be bottle-necked by lost and misplaced information. When the scientist of tomorrow in his laboratory needs information from the record, a machine librarian must be able to find everything relevant. It must be "fail-safe" and not miss information, Dr. John W. Mauchly, the co-inventor of the ENIAC and other electronic computing machines, told a recent meeting of the Chemical Literature Division of the American Chemical Society.

Railroad lights which turn a safe red when something fails in the system, or electronic computing machines which quickly stop before making mistakes if a tube burns out, are both designed to be fail-safe. The same principle applied to a library machine-searching system will insure, in spite of minor failures due to quirks of languages or of the classification system of the machine, that the essential information stored in the system will come out safely and will not be lost or passed over. Any slips or failures of man or machine must then cause more information rather than less to come from the searching system.

How to do this with the versatile UNIVAC electronic computing machines, six of which are now under construction by the Eckert-Mauchly Computer Corporation in Philadelphia for government and private users, was explained by Dr. Mauchly. In the first place, the UNIVAC is fail-safe against tube and electrical type of failures by its circuit design.

To make the UNIVAC fail-safe in the searching for recorded thoughts or ideas, Dr. Mauchly pointed out that the superimposed random or "probability coding" developed by the Zator Company in Boston should be used. Called "Zatocoding", the method is already in use in punched card information systems. With this system, he said, it is essential that a truly random code be assigned to each recorded idea, and then these codes be used for selection. This method, in its use of statistical principles of random codes to guarantee the desired results, has its analogue in certain of the most advanced radio communication systems which also use a statistical principle to get the message through with the utmost reliability and economy of equipment.

Used in the UNIVAC, the Zatocoding method would give a fail-safe system for information finding with all the wanted information coming out. If there is a statistically-possible wrong selection, then this "failure" would result in extra information, rather than missed information.

As an electronic librarian, a UNIVAC machine could easily supervise a collection of 10,000,000 books, about the number listed in the Library of Congress. You would specify what you wanted with any combination of up to 20 cross-reference ideas. Put into the UNIVAC, Dr. Mauchly said, these ideas would then direct the search at a rate of 150 items per second, and the whole collection would be scanned completely for you in 20 hours. Since the UNIVAC as now designed has a mathematical brain, instead of a specialized "library" brain, he said this performance could be speeded up by at least 10 times with slight changes in equipment.

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Oysters contribute nutritive value to the diet as well as being flavorful; they are an excellent source of proteins, minerals and vitamins.