

## MEDICINE

# May Cure Mental Disease

If disturbance in the balance of stop-and-go chemicals at nerve junctions is cause of mental disease, its conquest may be possible due to recent studies with nerve gas.

► THE CONQUEST of mental disease may be the peaceful by-product of nerve gas study at the Army Chemical Center, Maryland.

Better treatment for nerve gas victims is also likely from new knowledge of chemical secrets of mental disease. One possibility is that too much hormone chemical, serotonin, may cause mental disease.

Disturbance in the balance of stop-and-go chemicals at nerve junctions in the brain is the basic mechanism in mental disease, Drs. Amedeo S. Marrazzi and E. Ross Hart of the Army Chemical Center believe on the basis of their studies.

If this theory proves correct, cure of mental disease or at least control of the symptoms (as diabetes is controlled by insulin) would be possible by chemical treatment. The stop-and-go chemicals involved are ones Army Chemical Center scientists have studied extensively in connection with nerve gas poisoning. Dr. Marrazzi thinks he and fellow scientists know so much about them that they could find the right chemical to control mental disease.

The stop-and-go chemicals are known to scientists as adrenergic and cholinergic chemicals. Adrenergic chemicals inhibit, or stop, transmission of nerve impulses across the nerve junctions called synapses. Cholinergic chemicals excite, or give the go signal, to such impulses.

Grown people act the way they do, controlling rage and fear and other primitive reactions, because of a lot of restrictions that have been acquired through education. The restrictions presumably work through the stop chemicals. If something removes the restricting influence, such as too much alcohol, the normally well-behaved grown person may "act silly," Dr. Marrazzi explained. In the extreme case of socially unacceptable behavior, the person is in lay terms crazy, or mentally deranged.

In such a case, instead of alcohol, some other chemical presumably has counteracted the stop chemical in the brain, so it can no longer exert its restricting influence at nerve junctions. Uninhibited or "crazy" acts and reactions may follow. The chemical that blocks the restricting influence

## • RADIO

Saturday, March 26, 1955, 5:00-5:15 p.m. EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Maria Telkes, project director of Solar Energy Projects, Engineering Research Division, New York University, New York City, will discuss "Using the Sun."

may get into the brain from the outside or it may be formed in the brain through some defect in body chemistry.

The trouble may come if there is an excess of a hormone chemical, serotonin, which is normally present in the brain. Both too little and too much serotonin have been suggested as the underlying trouble in mental disease.

Serotonin has a chemical structure something like LSD-25, a chemical that can produce hallucinations and other symptoms of mental disease in normal persons. In cats serotonin, LSD-25, mescaline and adrenaline all stop nerve impulses across a special nerve junction in the brain, Drs. Marrazzi and Hart found. Mescaline also brings on hallucinations in normal persons.

Serotonin, however, is about six to eight times as potent as LSD-25 and 25 to 30 times as potent as adrenaline in stopping the nerve impulses. This last finding makes the Army Chemical Center scientists favor the idea that an excess of serotonin in the brain may be the underlying cause of mental disease.

Some parts of the brain may be more sensitive than others to change in the balance of stop-and-go chemicals, Dr. Marrazzi pointed out. A change in the balance at that place might show up first or the mental disease process might start there and then become general over the brain.

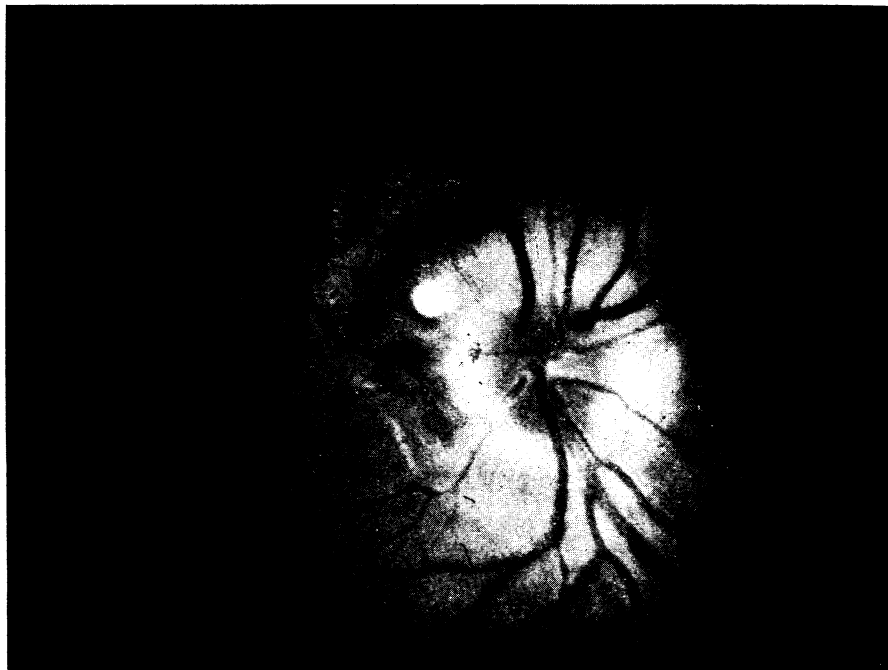
Right now the Army Chemical Center scientists are testing their theory of the cause of mental disease in three ways: 1. They are experimenting with transmission of nerve impulses over more nerve junctions in the brain. 2. They are trying more chemicals. 3. They are experimenting with humans to see whether the chemicals affect nerve impulses in human brains as they do in cats.

Serotonin, suggested as a possible mental disease remedy on the theory that a deficiency of it led to mental disease, has already been tested in schizophrenic patients. It failed to help them, which strengthens the theory that the fault may be too much rather than too little of this chemical.

The two best chemicals for mental disease at present seem to be chlorpromazine and reserpine, Dr. Marrazzi said. These are not cures, but they are quite successful in controlling anxiety which is a fundamental symptom in mental disease. They act like sedatives in that they quiet the patient, but unlike sedatives, they do not put him to sleep.

The cat studies are reported in *Science* (March 11).

Science News Letter, March 19, 1955



**LOOKING INTO EYE**—This picture of the inside of a hemorrhaged eye was taken with a new lighting and camera technique developed at Ohio State University. The hemorrhage shows up around the center of the photograph as an irregular darkened area. The university's setup has been used to observe the progress of nevi, usually benign pigmented conditions, ocular changes resulting from aging and the influence of heredity on the eye.