

PERMANENT WAVE MODEL

*This is a skeleton of a hair seen through atomic spectacles. Subjecting this model to tension will stretch it 100 per cent. In a hair this stretching is assisted by heat and steam and then the hair can be waved or set. Creasing of trousers is on the same principle. "Side chains" of the chemical model are not shown in this picture, but they would attach to the snap fasteners.*

## PHYSICS

## Models With Snap Fasteners Show How Hair Is Waved

WITH atom models 100,000,000 times natural size, held together with snap fasteners, science has been able to find what happens in such diverse processes as the waving of a woman's hair, the pressing of her husband's trousers, and the action of the muscle fibers in the bodies of either.

In his Franklin Medal lecture before the American Philosophical Society, Dr. Hugh S. Taylor, who is David B. Jones Professor of Chemistry at Princeton University, described his studies with these new models. He credited his student,

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## WYOMING

Fish in its mountain streams. Ride horseback thru its hills and canyons. Find Indian relics and marine fossils in this region of great historical and geologic interest.

The Patons welcome a limited number of guests at their ranch home in the Big Horn country. Cabins are comfortable, food good and horses gentle.

Write for illustrated folder with map

**Paton Ranch, Shell, Wyoming**

Bernard Becker, with working out many details.

By studying the effects of various substances on beams of electrons or X-rays, it is possible to deduce the arrangements of the atoms to form their molecules. The individual atoms are so small, however, that even the new super-power electron microscope would have to be 20 times more potent to observe them individually.

Knowing the arrangement of the atoms, models may be made, of special little wooden blocks. Formerly, said Dr. Taylor, these were held together with pegs, but he has made them so that they are joined with snap fasteners, like those used in clothing. These have the advantage that long chains may be subjected to various kinds of handling without having them fall apart, as they did with the pegs.

He finds that the silk protein, fibroin, consists of long chains of links called peptides. Each consists of atoms of carbon, hydrogen, nitrogen and oxygen. The silk fibroin chain is fully stretched, but with hair and wool protein, or keratin, there are at least three forms. In one the links are folded, but when it is stretched, it resembles the silk.

"The stretched form, or beta-keratin, is not, however, the normal form of hair

keratin," Dr. Taylor stated. "Normal or alpha-keratin must be a folded structure. It is these folds which are drawn out when the fiber is stretched and the stretched condition may be 'set' by exposure to steam heat while the tension is maintained. It is this process of 'stretching' and 'setting' which has attained the dimensions of a fine art, common to both sexes, in the 'permanent wave' and 'set' and in the 'trousers crease'. As is also well-known to both sexes, this imposed change is only temporary, the hair or wool reverting gradually to its normal folded alpha-keratin structure."

He also has found that muscle fiber, or myosin, has "the extension and contraction characteristic of hair fiber." The contraction and return to normal state, he declared, are chemically induced.

Perhaps these studies may aid in a better understanding of cancer. Models were made of substances that cause cancer. They found that there appeared to be some correlation between their power to produce the effect and the extent to which the atoms were all in one plane or not. The structure of vitamins, hormones, sulfa-nilamide and other new drugs is being studied. From these, perhaps, it will be possible to find out how they work in the body.

Science News Letter, May 3, 1941

## PSYCHOLOGY

## Seizures Do Not Permanently Damage Nervous System

### Psychologists Find That Rats Recover Soon From Epileptic-Like Attacks Caused By Noise

WHEN rats are thrown into epileptic-like seizures by noise, there is no permanent impairment of the nervous system, Dr. Harold Schlosberg and Dr. Frank W. Finger, of Brown University, told the Eastern Psychological Association meeting in Brooklyn, N. Y.

These sound-produced seizures in rats are believed by some psychologists to have a parallel in humans in the way bursting bombs and shrieking shells or sirens make some individuals jump and jittery.

Rats were exposed by these investigators to a whistle of extremely high pitch—almost the limit of audibility. Six different animals went into a total of 20 seizures during the course of the experiment.

After a seizure, the rats were unusually quiet, although there was no special drop in their activity after hearing the whistle if they did not have a seizure.

But the loss of activity was no greater than might be attributed to the fatigue naturally resulting from such violent activity as occurs in these frenzied attacks.

This fact and their failure to find any indication that repeated attacks produce a cumulative effect led Dr. Schlosberg and Dr. Finger to the conclusion that the sound causes no permanent damage to the nervous system.

The sound-induced fits are different, these scientists believe, from the "neuroses" that have been previously observed in other mammals.

Science News Letter, May 3, 1941

## Not the Same as Epilepsy

THE fits brought on in rats by the noise of a high-pitched whistle or air blast are not exactly the same as the "grand mal" epileptic fits in humans, it is indicated from a report by Drs. M. T. Long, R. T. Walsh and G. L. Kreezer, of Cornell University.

Many of the symptoms of the noise-induced fits in rats are so much like those of epilepsy that some scientists

have thought they might be equivalent.

In humans, however, it has been found that in the coma that follows grand mal attacks of epilepsy, the brain waves of the patient—those electric impulses originating in the brain itself—are greatly reduced in amplitude.

In the similar quiet stage following the rat's seizure, there is no such change in the electric activity of the brain, these scientists found.

Science News Letter, May 3, 1941

PSYCHOLOGY

## Present World War Due to Diseased Ways of Thinking

### Spartan Childhood Training and Recent Hardships Have Made Germans Victims of Irrational Processes

THE WORLD WAR and the "ghastly picture which the international scene exhibits" are due to irrational and diseased mental processes, especially in Germany, Dr. Edward C. Tolman, professor of psychology at the University of California, told the American Philosophical Society in the R.A.F. Penrose, Jr., Memorial Lecture.

The recent fad of working off anger by smashing a plaster figure with a satisfying noise is an example of the same sort of irrational thinking displayed by the Germans, who feel that they can overcome the barriers to their own well-being by smashing other nations, Dr. Tolman indicated.

This irrational process is known to psychologists as "displaced aggression." Because of the fact that it is irrational, such a diseased way of thinking cannot readily be overcome by logical argument or education.

Another such irrational and diseased mental process is termed "group identification." It is what makes the German feel that successes of the German Army and the Nazis are actually equivalent to his own individual happiness and success.

These irrational mechanisms have their start when, often in early childhood, the individual cannot get things essential for his own well being. He then substitutes, illogically, the successes of his family, school, economic class, nation, or even "hemisphere," and the leaders of these groups, as though they were identical with his own success.

Germany's relatively Spartan system of childhood training, as well as the hardships suffered recently by the German people, is blamed by Dr. Tolman for the widespread development there of diseased thinking.

"The only cure for Germany," he said, "would be a less rigid and Spartan system of training and a less mystical belief in German 'Blut und Boden.'"

In Italy, due to type of family and school discipline, youthful frustrations are probably not so great as in Germany and come more from the actual poverty of the country.

In America, the essence of our democracy has been, in the past, the ever-repeated breaking down of tendencies toward such irrational identification with the state and its rulers. Our free family life, schools, and democratic political procedures have insured that the welfare of the group or its leaders should not be regarded as more important than the welfare of the individual.

"But today," Dr. Tolman warned, "all is threatened. We Americans, like the denizens of the Old World, are beginning to talk primarily about group survival, group success, group enemies."

We need to ask ourselves, he said, how far this is logical and how far we, like the Germans and Italians are indulging in irrational, diseased group identification—how far the depression and recession, the horrors of unemployment and all the consequent suffering and frustrations have led us into displacing our aggressions against enemies abroad rather

## ● R A D I O

Dr. Gordon W. Allport, of Harvard University, will discuss "Morale, American Style," as guest scientist on "Adventures in Science," with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, May 8, 3:45 p.m. EDT, 2:45 EST, 1:45 CST, 12:45 MST, 11:45 a.m. PST. Listen in on your local station. Listen in each Thursday.

than against our true barriers at home.

In any case, he said, if the thinking is irrational and diseased, it grips us and we cannot give it up. If it is rational, we don't want to.

He sees only two ways out.

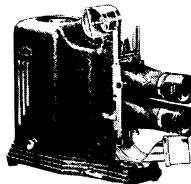
We must work for some larger, more powerful, more international group to emerge from this war in which our children and our children's children can more safely and happily "identify."

And we must see to it that the sacrifices demanded of individuals here are not so unreasonable as those demanded in Germany, remembering that only the well-being of individuals can build a good and worthy society.

"A surviving America," he said, "with the same soil erosion, pellagra, discrimination against racial minorities, and unemployment will not have been greatly worth the throwing away of our steel, our oil and our sons."

Science News Letter, May 3, 1941

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