



#### 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,



## WYOMING

Fish in its mountain streams. Ride horse-back 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, sulfanilamide and other new drugs is being studied. From these, perhaps, it will be possible to find out how they work in the body.

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#### 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*