

tioned, routine measure of prophylaxis.

Accessory causes the speaker divided into several classes: predisposing, precipitating, determining and sustaining causes. Predisposing causes may precede the primary causes, but serve merely to make a set-up for them, just as in the field of strictly physical ailments a general run-down condition may serve as the predisposing cause which makes possible the activities of tuberculosis or typhoid germs, which are the primary causes of their respective diseases.

After the primary cause has had its opportunity to take hold, some seemingly minor thing, like a bad fright or a severe disappointment, will serve as a precipitating cause. And an equally accidental occurrence may select which of several possible sets of symptoms the patient will display; this would be a determining cause. Thus, a man might be all set to become a "mental case," but it would be a matter of a chance whether he would take to hallucinations, or "seeing things," or whether he would develop the distressing nervous twitches called tics.

Finally, after a primary cause has been ferreted out and cured, there may have intervened some other factor that will keep the diseased condition going. Such a thing would be a sustaining cause.

Prof. Dunlap declared his conviction that the relatively poor showing made by mental medicine so far is due to a considerable extent to the preoccupation of psychologists and psychiatrists with immediate symptoms and their failure to dig deeper to find the real primary causes.

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#### COLLARED FOR HIS OWN GOOD

*A light wooden collar solved the problem of how to prevent this monkey in New York Zoological Garden's Animal Hospital from disarranging with his teeth the bandages upon his broken arm. (Courtesy Bulletin N. Y. Zoological Society.)*

#### BIOCHEMISTRY

# Second Male Sex Hormone Will Soon be Synthesized

## Exact Analysis Points Way to Prevention Of Distressing Abnormalities in Human Beings

**M**ALE SEX characters will be brought under control in their development, and distressing abnormalities in behavior will be subjected to experiments looking toward their elimination from the human stock, as the result of discoveries made in Swiss and Netherlands laboratories, reported at the San Francisco meeting of the American Chemical Society by Dr. L. Ruzicka of Zurich.

The basis of his statement is the definite determination of the chemical composition of a male sex hormone isolated last June by the Netherlands scientist, Prof. Ernst Laqueur. In the opinion of Dr. Ruzicka, the synthetic preparation of this hormone in sufficient quantities to provide ample material for studies of its effect in treating sexual abnormalities of male human beings, will be merely a routine matter requiring a few weeks or months.

This hormone is the second chemical messenger having to do with the development of male sex characters upon which Dr. Ruzicka has worked. The first was isolated from kidney secretion in 1931 by the German chemist Dr. M. Butenandt.

In 1934 Dr. Ruzicka and his assistants succeeded in producing this hormone in the laboratory from cholesterol, a widely distributed organic substance found abundantly in the yolks of eggs.

Through the experimental material thus provided, it was possible to demonstrate that there must be two male sex hormones, one present in kidney secretion and the other in the sex glands themselves. The isolation of this second hormone proved to be difficult, partly because it occurred in such small quantities, roughly in the ratio of one part in a million of glandular tissue.

Comparison of the effect of the artificially produced hormone with that occurring naturally in the tissue of male sex glands indicated that the difference between them was more a matter of potency than of chemical nature. In the light of this and other findings, Dr. Ruzicka explained, he predicted the empirical formula of the second hormone and prepared some of it in the laboratory.

When Prof. Laqueur succeeded in isolating the naturally formed hormone from gland substance, he found that it conformed closely to the formula predicted by Dr. Ruzicka, and the natural hormone could be converted into the substance prepared by Dr. Ruzicka by a simple process of oxidation.

As a result of these studies, the Swiss scientist stated, it is safe to say that both sex hormones can be manufactured in the laboratory. Both of them, like theelin, the female sex hormone, are derivatives of the widely occurring substance cholesterol. The male hormones differ in formula by two atoms of hydrogen. The female hormone contains six less atoms of hydrogen and one less of carbon, but has not yet been prepared synthetically.

The action of the second male sex hormone is so powerful that it will increase the weight of certain sex organ tissues in abnormal rats by more than four thousand per cent. Whatever use may be made of it in the treatment of human beings, Dr. Ruzicka warns, will have to await results of long and careful experimentation.

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