

may produce a condition favorable to the inhibition of hydrocarbon carcinogenesis, and experiments to test this point are in progress."

The cancer-causing chemicals are coal-tar derivatives. London chimney sweeps were the first recognized victims of cancer from tar compounds. Such cancers are rare in humans today, because the danger is known and can be avoided. Studies of the cancer-causing substances from tar, however, have shown that they are very similar to chemicals naturally found in the body, such as the bile acids and several hormones from the ductless glands.

Cancer may arise, according to one theory, from a defect in body chemistry by which cancer-causing chemicals, instead of harmless and useful ones, might

be formed. Assuming that this might be the case, Dr. Fieser and associates have studied animals to see what might become of the chemicals.

Rabbits fed some of the cancer-causing substances failed to get cancer and excreted from the kidneys what appeared to be detoxified derivatives of the original malignant compound. Study of the chemistry involved led Dr. Fieser to the theory of vitamin K as a possible protector against cancer that might be due to faulty body chemistry.

The place where the body chemistry might go wrong, producing cancer-causing substances by mistake, is, he believes, the cortex of the adrenal glands which produces the hormone that saves the lives of Addison's disease patients.

*Science News Letter, September 28, 1940*

#### BIOLOGY

## Parties and Petting Observed Among One-Celled Animals

### Paramecium Seems To Recognize Castes and Have Taboos Against Cousin Marriages; Fix Hours for Social Events

**T**HE sex drive, the urge to find a mate, underlies social behavior among animals clear down to the very bottom of the evolutionary scale, Prof. H. S. Jennings of the University of California at Los Angeles pointed out before the University of Pennsylvania Bicentennial Conference in Philadelphia.

Prof. Jennings has made an intimate study of the behavior of the microscopic one-celled creatures known as Paramecia or (because of their shape) as slipper-animals, that swarm in stagnant fresh water. He has found types of behavior startlingly similar to parties, petting or flirting, and the formation of family groups or clans with rigid taboos against cousin marriages.

Ordinarily, these tiny slipper-animals reproduce by simple division. One cell splits and makes two; these separate and in turn become four, and so on. But occasionally they do resort to sexual reproduction. Two cells unite temporarily, exchange protoplasm, and then swim away again, to continue the race. It is here that the social behaviors watched by Prof. Jennings begin.

The clan or family groupings which Prof. Jennings observed are rather complex. In one group, there are four mating types or castes. Members of the same

caste will not mate with each other, but will mate with individuals of the other three castes. There is a second group of eight castes, none of which will have anything to do with the castes of Group I, but each of which will mate with the other seven castes in its own group. Finally there is a third group of four castes, likewise snobbish toward the twelve castes in the first two groups. Thus there are in all, in this microscopic universe, three tribes of 16 castes, with a most complex set of taboos.

However, when groups of individuals which will consent to mate with each other are mixed, they do not proceed to pair off immediately, but "hold a party". They bunch together in tight crowds, clinging as tightly as if they were all covered with glue. Only after this "party" breaks up do the individuals pair off and actually mate. There are even fixed hours for the parties; they start only between 8 and 9 in the morning and at 5 or 6 o'clock in the afternoon.

Sometimes, instead of mating at once, a pair of the little animals will remain in casual contact, swimming along in spirals. This may last for only a few seconds—a temporary flirtation. Or it may continue for a much longer time, ending in mating—a real courtship.

*Science News Letter, September 28, 1940*

## Anti-Influenza Defenses

**T**HE NOSE has two defenses against influenza, one of which may also operate against infantile paralysis, Dr. Thomas Francis, Jr., of New York University College of Medicine, told the Conference.

For protection against influenza, it appears from his discoveries, scientists will have to find methods of bolstering these nose defenses rather than methods of bolstering general body defenses such as are successful in protecting against diphtheria and smallpox, for example.

The two nose defenses, he believes, may complement each other in affording protection against influenza.

One of them, found in humans, consists of antibodies in the nasal secretions that can inactivate the influenza germ or virus. Antibodies are one of the body's defenses against many other germs, but are generally found in the blood. Influenza-fighting antibodies are also found in the blood, but their presence there does not protect a person against influenza, Dr. Francis has found.

The other nose defensive mechanism against influenza, discovered in ferrets, is a change in the character of the tissue cells lining the nose and upper respiratory tract. This change comes during an attack of influenza and consists in the destruction of many of these cells, followed by their regrowth in a form highly resistant to subsequent injury by influenza. The resistance, however, is not lasting, disappearing as the resistant repair cells are replaced by normal cells.

Tests of the nasal secretions of 668 normal persons, of ages ranging from three months to 30 years, showed that the flu-fighting antibodies are apparently present at birth, disappear during the first two years of life, and then increase again. The highest proportion of samples containing influenza virus-inactivating substance was found among persons from five to 19 years of age.

*Science News Letter, September 28, 1940*

## Eat Fats and Vitamins

**E**AT more fats and vitamins and less sweet and starchy food to protect yourself against tooth decay, is the advice of Prof. Elmer V. McCollum, Johns Hopkins University.

A still unidentified substance, present in the saliva or mucous secretions of the mouth or both, plays a part in suppressing germs that affect tooth health, Prof. McCollum is convinced. People who have good teeth probably have plenty of this

substance. People whose teeth decay easily probably do not have much of it. Its presence presumably depends on good nutrition. Until more is known about it, the best protection against tooth decay is a good diet and frequent visits to the dentist to check earliest spots of decay.

The advice to eat more fats and less sugar and starches comes from experience with diabetics who must follow such a diet because of their ailment. Although they have cavities in their teeth, the walls of the cavities are said to be unusually hard and to have resisted the spread of the decay.

*Science News Letter, September 28, 1940*

## Operate for Schizophrenia

**S**UCCESS with a brain operation for schizophrenia, commonest form of mental disease, was reported by Dr. Edward A. Strecker, of the University of Pennsylvania School of Medicine, at the University's Bicentennial Conference.

The outlook for the "forgotten patients" who have resisted all efforts to penetrate the defenses of their imaginary world and are "dreaming away their lives in quiet corners of mental hospitals" is no longer so hopeless, it appears from Dr. Strecker's report of results with both the new operation and the electric and drug shock treatments now being used for schizophrenia.

Patients who had been hopelessly insane for more than ten years, and who had not been helped by any other method of treatment, were helped to an "amazing" degree by the brain operation, Dr. Strecker said, although it did not effect complete cures.

The operation is known technically as prefrontal leucotomy, meaning that the white matter in the prefrontal lobes of the brain is cut. Dr. Egas Moniz, of Spain, originally devised the operation. Dr. Walter Freeman and Dr. James W. Watts, of Washington, D. C., introduced it into this country with some modifications for patients in late middle life suffering with agitated melancholia. Trial of this operation for relief of schizophrenia was proposed by Dr. Strecker.

The eight patients whose cases Dr. Strecker reported were operated on by Dr. Francis Grant, of the University of Pennsylvania.

"The results," Dr. Strecker reported, "were interesting and sometimes truly amazing. The aggressiveness, in some instances homicidal in degree, disappeared; mental material which one would have believed irretrievably lost was ap-

parently salvaged by the operation and was utilized by the patient in establishing realignments with life; panic reactions due to hallucinosis were terminated. The hallucinosis continued but a recall of the patient to reality in some of the cases was very easy, a few simple questions sufficing."

*Science News Letter, September 28, 1940*

## Urge Marriage Advice

**P**SYCHIATRIC treatment, not merely for mentally ailing individuals, but for whole sick nations, was urged as a basic need before the meeting by Dr. Arthur H. Ruggles, secretary of the American Psychiatric Association. He raised some questions which he challenged fellow psychiatrists to answer:

"Groups are being faced with limitation through mass sterilization. Are we to subscribe to the wholesale sterilization of the defective and of what are called the inferior? It might be easy to answer this question regarding the defective, but is the psychiatrist or anyone else yet able to give an accurate answer to what is inferior stock?"

"Is it well for the mental health and efficiency of human beings for them to be long deprived of the freedom of speech, the freedom of the press, and the encouragement of individual initiative? The psychiatrist from his vantage point would definitely say that these restrictions imposed by some social groups are unwholesome and lead to repression and emotional conflicts. Our experience seems to bear this out and, therefore, we must raise our voices in protest against it lest we develop a nation of insecure, unhappy and relatively inefficient people."

The psychiatrist, in Dr. Ruggles' opinion, can contribute materially toward the solution of the increasingly pressing divorce problem, by helping to prevent marriages foredoomed to end in the divorce court. On this point, he said:

"No group nor nation can hope to be mentally well while divorce increases three-fold in fifty years and exceeds by many times the divorce rate in any other national group. How can a country hope for national health when the feeble-minded, psychopathic, neurotic and psychotic are permitted to marry and raise progeny without any psychiatric evaluation? Psychiatric consultation with the parents, lawyers and clergy would prevent many a marriage doomed to failure and much psychic trauma to children, as well as help to make divorce something other than a regional racket."

*Science News Letter, September 28, 1940*

## Single Photon May Kill

**T**O KILL or maim a living cell with radiation, it is not necessary to riddle it with bullets (photons) of light or X-rays, like the machine-gunned victim of a gangster massacre. A single one of these invisible missiles will do the work if it hits a vital spot, Dr. Paul Henshaw, research fellow of the National Cancer Institute, Bethesda, Md., declared in an address before the University of Pennsylvania Bicentennial Conference.

Dr. Henshaw's experiments were performed on single, free-existing cells, like eggs of sea urchins, sperm of fruit-flies, yeasts and bacteria. His conclusions do not hold directly for large aggregations of interdependent cells like the human body.

The vital spot that must be hit in a cell is one of the sub-microscopic control units known as a gene, hidden within the cell's nucleus. Sometimes a sperm or egg cell that has been thus hit will produce very strange effects in the offspring.

*Science News Letter, September 28, 1940*

## Workers Don't Live for Pay

**T**HE IDEA that workers live only for their pay check was challenged by Dr. Morris S. Viteles, psychologist of the University of Pennsylvania at the Bicentennial Conference.

The demand for increased wages, he said, may be merely a way of expressing fundamental dissatisfaction with an organization that fails to provide for the deep-seated intellectual and spiritual needs.

Dr. Viteles denied that the psychologist is primarily concerned with increasing efficiency in production. He must study the possible consequences of our industrial order in mechanizing the mind, creating mental conflicts, and diminishing creative power.

Civilization is not to be judged by a material yardstick, he declared.

"There is little merit in a civilization which dulls the mind, warps the emotions, destroys the will, and reduces the individual to an automaton, even though it succeeds in providing an ever-increasing supply of material goods for general distribution."

*Science News Letter, September 28, 1940*

The library of the American Medical Association, which ordinarily receives 1,400 periodicals, reports that *medical literature* from Europe is scarce these days.