

BIOCHEMISTRY

Ultraviolet Light Changes Carrot Pigment Into Vitamin A

Confirmation of British Experiments May Result in Large Scale Production and Introduction of Vitamin Into Foods

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VITAMIN A, the food factor that promotes growth and prevents infections, is produced when ultraviolet light of a particular wavelength acts on carotene, the yellow pigment found in carrots, yellow corn, butter, egg-yolk and other plant and animal substances, Drs. F. P. Bowden and C. P. Snow, of Cambridge University, announced in a report to *Nature*.

Ultraviolet light of wavelength 2650 Angstrom units transforms the mother substance, carotene, into the vitamin A. This light is too short to be seen by human eyes but it can be recorded on photographic plates.

The production of vitamin A was checked by the fact that the substance formed absorbs ultraviolet light in the way that known vitamin A does. It also yields a colored substance when treated with antimony chloride which is another test for vitamin A. The irradiated carotene has not yet been tested biologically upon animals, however.

Production of vitamin A from the yellow pigment, carotene, by action of ultraviolet light is another step to understanding the essential food elements that a few years ago were totally unknown.

Rapid progress has been made in the past few months in the chemistry of vitamin A. It is definitely known that carotene, such as used in the Cambridge University experiments, is the precursor of vitamin A. Other experimenters have shown that carotene is converted into the vitamin in the liver and early this year Prof. J. C. Drummond of University College, London, obtained vitamin A by splitting carotene into two products, one of which was the vitamin.

Prof. Paul Karrer of the University of Zurich, Switzerland, recently derived a formula for vitamin A and showed it to be a close chemical relative to artificial violet perfume.

The ultraviolet light which activated carotene into vitamin A is not contained

in sunlight. Vitamin A will not be known as a "sunshine vitamin" like anti-rachitic vitamin D which is produced by the irradiation of foods and the chemical ergosterol.

Production of vitamin A on a large scale and its manufacture in foods, such as bread and cereals, in the same way that vitamin D is introduced, can be expected to result if the British experiments are confirmed.

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PHYSIOLOGY

Headaches May Be Caused By Food Sensitiveness

HEADACHES may be caused by hyper-sensitiveness to certain foods, it appears from a report of Drs. Ray M. Balyeat and Herbert J. Rinkel of Oklahoma City to the American Medical Association. These physicians studied the various types of headaches due to this cause. They found that women have longer, less frequent attacks, while men have frequent attacks of shorter duration.

The symptoms vary in different persons and in different attacks in the same person. Several members of a family may

PSYCHOLOGY

Timing Winks Reveals More About Human Nature

SCIENTISTS at the psychological laboratory of the University of North Dakota have been studying the winks of human beings. The extent of the wink has been measured by a precise instrument. The inter-wink period has been exactly timed.

The average college student winks once every 5.99 seconds when he is not aware that his behavior is being watched and recorded, it was found by Dr. C.

W. Telford and Beatrice O'Donnell Anderson, the psychologists who will report their research in the *Journal of Experimental Psychology*.

Many persons have headaches caused by inflammation of the nasal sinuses. In these cases the food sensitiveness is often a predisposing factor, Dr. Balyeat said. This occurs especially in hay-fever victims.

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PHYSICS

Cry of Tin Due To Birth of Twin Crystals

FOR YEARS chemistry professors have entertained classes by letting them listen to the "cry of tin," a creaking or tearing sound that is emitted by a bar of metallic tin when bent. Now Bruce Chalmers, working in the physics laboratory of University College, London, has discovered that this noise of tin is a sort of birth cry of the crystals in the metal becoming twins.

Using wires of single tin crystals, he stretched them and found that they lengthened without sound until the single crystal turned into two when the cry was heard. Cadmium and zinc were also made to produce cries. In his report to the scientific journal, *Nature*, Mr. Chalmers concludes the tin cry is produced by twinning in the metal and not by grinding of crystals against one another during bending as has previously been supposed, and that it has been heard only in those metals whose crystals twin when stretched.

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When the students knew that they were being watched, but were instructed to go ahead and wink at their natural rates, one wink to every 5.31 seconds was recorded.

Ten persons volunteered to sit in the laboratory and allow their winks to be

ARCHAEOLOGY

Stone Age Love Scene Found in Cavern of France



STONE "TEDDY BEAR"

Perhaps children of the man and woman pictured in the love scene played with this bear, or it may have been a charm used in dangerous magic.

counted and measured for science. The stimulus for the wink in the case of these subjects was not a co-ed but a hammer coming down against a piece of glass at about the level of the eye.

Not all the winks are the same size, it was found. At the first hammer blow the eye automatically winks rather vigorously, but if this blow is quickly followed by another the size of the second wink is reduced. The longer the interval between the hammer blows, the bigger the winks. This holds for as long as six seconds between blows. This recovery time required by the wink mechanism before it gets back to normal is called by psychologists the refractory period.

The refractory period, it was found, is followed by a period of abnormally large response.

Attempting to keep from winking makes the effect of the refractory period even more noticeable. But when the subjects were told to wink voluntarily each time the hammer fell, there was no sign of a refractory period longer than one second. Practice increased the length of the refractory period for the automatic winks and shortened it for winks on the voluntary level.

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WHAT appears to be a Stone Age love scene between a cave man and his lady is the latest discovery of Stone Age art from caverns of southern France. Yes, the cave man is pursuing the woman. He has no club, but a harpoon point has been shot into her leg.

This scene recorded in art some 20,000 years ago is the discovery of a French archaeologist Count René de St. Périer, reported in the scientific journal *L'Anthropologie*. Exploring the recesses of the Grotto of Isturitz, in southern France, the Count has found two important art objects from the Magdalenian period of Stone Age human history.

One object is a little brown bear sculptured in sandstone, and so cleverly sculptured that it is hailed by the archaeologist as a gem of realistic art. The other object is a long piece of bone, with pictures engraved on both sides. On one is a bison hunt, and on the other a man and woman of the Old Stone Age.

In order to depict the man and woman on the long, narrow piece of bone, the artist placed the woman entirely

above the man. That is, so they appear when the bone object is held vertically. The French archaeologist, who has studied his prized discovery carefully, suggests that the artist meant the figures to be understood as standing side by side.

The woman's head is broken off. She wears a necklace and an anklet.

The man has bobbed hair, and wears a necklace and bangle. His head, shown in profile, has a receding forehead. Both the figures have their hands upraised in a gesture of supplication.

The French archaeologist interprets the harpoon in the woman's leg as a symbol of conquest. The man's attitude, he points out, does not appear hostile.

What the rites of courtship were 20,000 years ago in Europe, is lost knowledge. The Count de St. Périer comments that the engraving of the man and woman is "a document which should be preserved in the hope that some day new discoveries will permit further raising of the veil which hides the mental processes of the Stone Age people."

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ENGINEERING

Engineers to Refrigerate Concrete in Hoover Dam

THE HOOVER DAM, like other modern structures, is to have a mechanical refrigerator. But this will not be for conventional reasons.

The contractors pouring the colossal mass of concrete in Black Canyon must contend with a peculiar habit of Portland cement, of importance only with very large blocks of material. Cement has a considerable amount of latent chemical energy which is released during the setting operation. The silicates and aluminates of lime, of which Portland cement is composed, generate heat when they combine with water. In this respect they act like old-fashioned quicklime, only not so fast and not so hot.

In ordinary jobs, such as sidewalks or concrete walls, the release of heat is

of no consequence, as the mass is small and the structure is readily cooled by contact with earth or atmosphere. In the vast block of Hoover dam the heat will not have a fair chance to escape without special assistance. Without refrigeration the inside portion of the concrete would harden at steaming hot temperatures. The outside would set in a cool state. In due time the hot core would cool, shrink and crack. Studies of the heat given up by cooling concrete have been made in the past, but no structure of large concrete mass is believed to have had refrigeration.

An elaborate and very expensive system is planned, whereby chilled water will circulate through numerous pipes in the freshly poured concrete.

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