Medical Sciences Notes

VIROLOGY

Virus Assembled in Test Tube

A virus that normally lives in the stomach has been assembled in a test tube by scientists at the California Institute of Technology, Pasadena. The T4 virus, the second to be artificially put together, is structurally much more complex than the tobacco mosaic virus which was first to be assembled in the laboratory.

Geneticist Robert S. Edgar led a two-man team that assembled T4 by combining the separate component parts of its total structure. T4 has six major parts—head, collar, score, sheath, endplate and fibers. Mutants of T4 that were found to be defective in some way were used for the assembly of a viable virus. For example, some mutants lacked the genes needed to make heads; others were missing genes for tails. When the researchers mixed them together in a test tube, they got a complete virus as a result.

T4 is considered an ideal experimental model for research into the steps by which complex organisms are naturally assembled because it is not only complex itself but also very easy to work with in laboratory tests.

TECHNOLOGY

Fiber Optics for Heart Studies

Heart specialists can now get quick and accurate information on oxygen saturation of blood by using a kind of light pipe. The information is needed in diagnosing heart defects.

Fiber optics are incorporated in standard cardiac catheters and in special tubing to form a device called the oximeter-densitometer. One bundle of 50 fibers transmits light from a light source located in the instrument to the end of the catheter located in the heart, a blood vessel or a lung vessel.

When the light enters the blood it is scattered by the red blood cells, illuminating an area about three millimeters in diameter around the catheter tip. A portion of the light, after it is absorbed and scattered by the red cells, returns to the tip of the catheter, thus supplying sufficient information for determination of the oxygen saturation of the blood.

The oximeter-densitometer incorporates the principles of remote spectrophotometry to analyze blood composition whereas in conventional methods blood samples must be removed from the patient for analysis.

Reporting the new instrument in the March issue of APPLIED OPTICS are N. S. Kapany, N. Silbertrust, R. P. Drake and T. McLaughlin of Optics Technology, Palo Alto, Calif., with Drs. D. C. Harrison and H. A. Miller of the Stanford Medical School, Stanford, Calif.

HEART VALVE

Artificial Heart Valve Improved

A trileaflet artificial heart valve that approximates a normal one has been developed at Georgetown University Medical Center, Washington, D.C., where Dr. Charles A. Hufnagel in 1952 inserted the first plastic valve into the aorta of a patient. It is the fourth heart valve to be developed at the center.

The new valve is a single unit made of polypropolene that is reinforced and coated with silicone and heparin—an anticlotting combination named Hepacone. Clotting is a major cause of heart failure.

Collaborating with Dr. Hufnagel in the design were Drs. John F. Gillespie and Peter W. Conrad, assistant professors of surgery at Georgetown. The valve has had successful animal tryouts and is expected to be used on humans within a few months.

DENTAL CARIES

Phosphate Food Additive

A phosphate-based food additive that promises to reduce tooth decay by putting back what technology has taken out during food processing is reported from Sydney, Australia.

Colonial Sugar Refineries, Ltd., made the discovery jointly with Melbourne University more than six years ago.

The report, which had been withheld because of worldwide commercial potential, has now been made by two Sydney scientists in charge of human trials. Dr. John C. Beveridge, professor of pediatrics, University of New South Wales, and Robert Harris, director of the NSW Institute of Dental Research, made the announcement at the Australian Dental Congress. Dr. Bernard Lillienthal, now in London, did much of the initial research.

The additive, which comes as a fine white powder, can be included in sugar, bread, flour biscuits, jam, ice cream and soft drinks, but may not be commercially available for some years. In the case of sugar, the compound—calcium sucrose phosphate—is added during refining and coats the sugar crystals. When sugar is eaten, the additive, which is soluble, becomes detached in the mouth and penetrates to a crystalline sublayer of the dental enamel.

. . . and Chewing Gum

The April issue of THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION carries a report on reduction of tooth decay with a dicalcium phosphate dihydrate gum by two University of Alabama professors of dentistry.

Drs. Sidney B. Finn and Homer C. Jamison of Birmingham divided 606 children in an Alabama institution into three groups. Group one chewed a sugar gum, group two a sugarless gum and group three a sugar gum containing the phosphate combination.

Although the sugarless gum ran a close second to the phosphate gum, the latter had better effects on the back teeth. The phosphate gum is not on the market.

CONGENITAL ABNORMALITY

Woman with Two Wombs

In a rare case, a woman with two wombs and two vaginas is reported bearing four children, alternately in one and then another of the two uteri over a period of years. Only one tube and one ovary were attached to each uterus.

The births were by cesarean section at the Highland View Hospital, Amherst, Nova Scotia, after the woman had been referred to Victoria General Hospital in Halifax for study. All four children were normal.

Reporting the case in the March 18 issue of THE CANADIAN MEDICAL ASSOCIATION JOURNAL were Dr. Donald C. Brown of Amherst, and Dr. Robert F. Nelson of Montreal, Canada.