BIOCHEMISTRY

Dead Bones Live Again

Foresee better control over abnormal bone formation as result of development of diets that reduce tooth decay in animals by 75 per cent.

► APPARENTLY DEAD bones have been revived and endowed with twice the ossifying power they had before their destruction in experiments reported by Dr. Albert Edward Sobel of Brooklyn, N. Y., at the joint meeting of the American Chemical Society's Chicago Section and the American Association of Clinical Chemists in Chicago.

Diets that reduced tooth decay in laboratory animals by 75% in extent and severity were developed in the same research.

Improved control over abnormal bone formation and more skillful treatment of bone wounds are foreseen as a result of this fundamental work.

It all started when Dr. Sobel and associates in the chemistry department of the Jewish Hospital, Brooklyn, studied the composition of new mineral deposited in bits of living bone from solutions containing the mineral ingredients of bones and teeth. These are calcium phosphate and calcium carbonate.

From carbonate-rich solutions the mineral which came out was rich in carbonate. From phosphate-rich solutions it was richer in phosphate. From this information, diets were designed to produce blood rich in carbonate or rich in phosphate. The diets were then fed to cotton rats.

These laboratory animals are susceptible to dental caries closely resembling tooth decay in humans. The high carbonate-low phosphate diet produced teeth high in carbonate. The low carbonate-high phosphate diet produced teeth low in carbonate.

Because acids produced in the mouth can dissolve the calcium carbonate portion of tooth minerals without dissolving the other tooth mineral, calcium phosphate, Dr. Sobel expected the teeth high in carbonate to be more susceptible to decay. This was the case.

Animals with good tooth composition had only about one-fourth as much tooth decay as those with poor composition, and the decay in each tooth was less than one-fourth as great in well constructed teeth.

The revival of dead bone cells was done with bits of bones taken from living animals. The bone cells were apparently killed by treating them with salts of magnesium, copper, beryllium, strontium and ordinary table salt. These salts destroyed the mineralizing power of the bone cells, whether there was a lot or no calcium present.

The bone cells were then revived and their ability to mineralize was restored by treating them with calcium chloride. The bone cells can be revived up to half a day.

A chemical called an enzyme, Dr. Sobel and associates found, plays a big part in governing the mineralization of bone. This chemical cannot work unless it combines with calcium. Other salts, like copper, beryllium and magnesium, however, can compete with the calcium to combine with this enzyme. When they succeed, they block the ability of the cell to ossify, or form new bone cells.

Shaking the bone cell with a calcium salt when none of these other salts is present makes the "marriage" of calcium and enzyme take place at a greater rate than under normal conditions in the living body. The result is that the revived cell has a greater ability for mineralization than before.

Science News Letter, June 6, 1953

● RADIO

Saturday, June 13, 1953, 3:15-3:30 p.m. EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Melbourne R. Carriker, assistant professor of zoology, Rutgers University, State University of New Jersey, New Brunswick, N. J., discusses "Farming our coastal Waters".

EDUCATION

Girls Go to School Longer Than Boys

► SIGNS THAT the so-called weaker sex is perhaps becoming the more learned appear in a study by Metropolitan Life Insurance Company statisticians.

At least, the girls go to school longer. In 1950, women 25 years and older had on the average 9.6 years of schooling compared with 9 years for the men. For women, the average years of school completed increased by almost one year in the past decade while for men the rise was not quite one-half year.

U. S. Bureau of the Census figures were the bases of the study.

Science News Letter, June 6, 1953

VETERINARY MEDICINE

Vaccine for Blue Tongue

► DEVELOPMENT OF a vaccine to combat the mysterious killer of sheep, the African blue tongue disease, seems near success. This was reported by Drs. D. G. McKercher and Blaine McGowan, Jr., of the University of California School of Veterinary Medicine, Davis, Calif.

The researchers have been developing the vaccine by passing the living virus, isolated from an infected sheep, through a long series of transplantations into fertile hen's eggs. This treatment seems to weaken, or attenuate, the virus, so that it can be given to healthy animals who then build up resistance to the virus.

In six months they have passed the virus through 30 generations.

Blue tongue, until it was discovered recently in California flocks, was hardly known outside of Africa. Dr. R. A. Alexander, South African expert on the disease, is now in the United States at the request of the U. S. Department of Agriculture, to lend his experience to solving the blue tongue problem here. (See SNL, May 9, p. 303.)

Besides studying the California outbreak, Dr. Alexander has already verified the presence of the disease in Texas flocks and said all evidence points to its occurrence in Utah.

A vaccine against blue tongue is already in use in South Africa. However, some experts fear that the South African vaccine is for a virus strain not present in the United States and that its importation here might lead to the introduction of the strain.

Blue tongue disease struck flocks totaling 325,000 head last year in California, resulting in 15,000 deaths and large losses from poor wool production and loss of weight of infected animals.

Science News Letter, June 6, 1953

TECHNOLOGY

Streamlined Periscopes To Go on Navy Submarines

► STREAMLINED PERISCOPES for Navy submarines will allow the underwater ship-killers to move faster without detection while scanning the sea for targets.

Experiments in the David Taylor Model Basin tow tank at Carderock, Md., revealed that streamlining periscopes cuts down telltale splashing, or pluming, of the "up" periscope on the fast-moving submarine. Sleek lines also keep the periscope from vibrating, a problem which has "blinded" the sub's "eye" at high speeds.

Streamlined periscopes now are being installed on the Navy's front-line subs by engineers of the Edo Corporation, College Point, N. Y. A company spokesman said also that problems "aggravated by the development of the snorkel" have been licked.

Science News Letter, June 6, 1953