

"EXTINCT" FISH FOUND IN 1939

Almost like finding a live dinosaur was the discovery of this strange fish, captured early in the year off the eastern coast of South Africa. It belongs to a family supposed to have been extinct for millions of years. It is now the prize possession of the East London, S. A., museum, whose curator, Miss Courtney Latimer, has been made its scientific godmother: its generic name is *Latimeria*.

PHYSICS

Powerful Electron Microscope Magnifies 12,700 Diameters

Photographs Taken With New Toronto Instrument
Are Further Enlarged by Photomicrography to 180,000

WHAT is believed to be the world's most powerful microscope, capable of magnification of 12,700 diameters, has been developed at the University of Toronto by Drs. E. F. Burton, J. Hillier and A. Prebus. (*Physical Review*, Dec. 1)

The Toronto apparatus is an electron microscope in which high speed electrons fly down a large vacuum tube, penetrate thin layers of the material being examined and then fall on a photographic plate. Pictures of what colloidal gold looks like at a magnification of 12,700 diameters are shown in the scientists' report. To make the pictures suitable for magazine reproduction they are enlarged still further, by photomicrography, until the total magnification amounts to 180,000 diameters.

This additional enlargement is not the crucial magnification of the instrument, determined by its resolving power which amounts to 60 Angstroms, or 0.000006 of a millimeter.

The best previously reported resolutions of electron microscopes have come from Germany claiming resolution of 0.00001 of a millimeter.

Most powerful microscope of the ordi-

nary optical type is that announced in 1938 by Drs. E. C. Dane, Jr., and L. C. Graton of Harvard University which—while capable of total magnification of 50,000—had a limit of resolution of 6,000 diameters. The new Toronto electron microscope exceeds this magnification by over 2.5.

Dr. V. K. Zworykin, scientist of the Radio Corporation of America and authority on the construction of electron devices, has placed the theoretical resolving power of electron microscopes at 0.000001 of a millimeter. Thus the Toronto apparatus is only six times above this limit.

Science News Letter, December 23, 1939

MEDICINE

New Syphilis Medicine To Be Taken in Pills

A NEW syphilis medicine which can be taken in pills has been developed by Dr. Paul J. Hanzlik and assistants of Stanford University School of Medicine.

Success with exacting trials of the drug for over four years, in syphilis

clinics in San Francisco, Los Angeles, Cleveland, and Philadelphia, was announced recently. At the same time the American Medical Association in Chicago announced that its council on pharmacy and chemistry has accepted the new medicine as an anti-syphilitic agent.

Sobisminol is the name of the new syphilis medicine. It is a bismuth compound. Its great advantage is that it can be taken in pills, or capsules, at home, thus cutting down the number of visits to clinic or doctor's office and, of course, making unnecessary the hypodermic injections of bismuth which have been part of syphilis treatment.

The new medicine, however, is not a short-cut to a syphilis cure. It must be taken in combination with injections of arsphenamine or one of the other arsenical compounds. The total course of treatment still takes nearly two years, made up of alternating periods of six to 10 weeks of weekly arsphenamine injections and 10 to 20 weeks of taking the sobisminol capsules.

The new medicine will be sold on a physician's prescription only. Bismuth, the active ingredient, is a poison which is not safe for patients to prescribe for themselves. The new medicine is protected by patent held by Stanford University and the licensing agreements already made with three drug manufacturing firms restrict the sale of the drug without prescription and also forbid its exploitation to laymen by newspaper advertising, radio, or window displays. Royalties will be used for further research in syphilis and related problems.

Sobisminol is said to produce quite prompt healing of syphilitic lesions and to have a killing effect on syphilis germs

● RADIO

"Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, will be augmented with special programs due to the many scientific meetings during the Christmas season.

Monday, Dec. 25, 4:30 p. m. EST, Watson Davis will present the highlights of the year in science, speaking from Washington.

Tuesday, Dec. 26, 6:15 p. m. EST, Dr. Wesley C. Mitchell, retiring president of the American Association for the Advancement of Science, will discuss public relations of science. Introduction by Dr. Walter B. Cannon, president. From Columbus.

Friday, Dec. 29, 4:00 p. m. EST, Dr. F. R. Moulton, permanent secretary, A.A.A.S., will join with Watson Davis in interviewing leading scientists attending the A.A.A.S. meeting. From Columbus.

Monday, Jan. 1, 4:30 p. m. EST, Watson Davis, director of Science Service will forecast advances of science for 1940. From Washington.

Listen in on your local station. Regular programs will continue each Monday, 4:30 p. m. EST, 3:30 CST, 2:30 MST, 1:30 PST.

in the blood and tissues. Because of its ability to penetrate the brain and nervous system, it has been found to bring relief from pain in a high percentage of cases in the late stages of neurosyphilis. One physician who used it in treating patients reported that if used early in syphilis it "may prove to be of value in the prevention of neurosyphilis."

The feat of producing a bismuth compound for oral treatment involved making a hypothetical chemical compound which had never been actually manufactured. This is triisopropanolamine, which is combined with sodium bismuthate and propylene glycol to make a bismuth compound that can be absorbed from the stomach into the blood, which is stable enough to withstand chemical action in the digestive system, and which prevents heat coagulation of the blood.

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PHYSIOLOGY

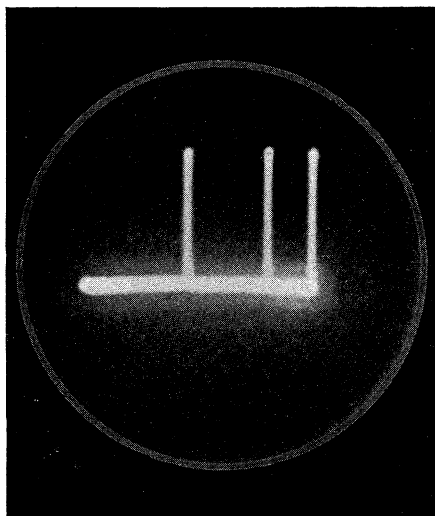
Miss and Mrs. America Are Growing Slimmer

MISS and Mrs. America, congratulations! You are getting thinner, judged not by any illusion of fashions but by very factual, unemotional insurance pounds.

For many years the public has been steadily bombarded on the perils of obesity. Sound health reasons—overweight promotes higher mortality and more illness from diabetes and chronic degenerative diseases of heart, kidneys, circulatory system generally—were reinforced by dictates of dress, the athletic figure becoming popular.

The propaganda did its work. The scales of the Metropolitan Life Insurance Company examiners show a decline in the average weights of women, 1932-34 compared with 1922-23, for almost every height at every age . . . not large . . . usually 3 to 5 pounds . . . but weightedly conclusive.

Science News Letter, December 23, 1939



OUTSTANDING DISCOVERY

The splitting of uranium atoms with slow neutrons and with the release of enormous amounts of atomic energy led the achievements of 1939. When the energy is detected and put into an oscillograph, electrical pulses can be seen which closely resemble those shown here.

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to the height of 70,000 feet showed that the "hard" component of cosmic radiation consists of mesotrons, while the "soft" component consists of electrons, either positive or negative.

The "birth place" of mesotrons was shown to be within the earth's atmosphere at altitudes above 14,000 feet.

Ions of hydrogen and perhaps even heavier atoms flying into the earth's atmosphere from outer space were suggested as the cause of the newly found mesotron particles.

Chemists were able to obtain 1 1/5 gallons of gasoline out of each gallon of crude oil by newly developed hydrogenation processes.

Research seeking to produce artificially the red coloring matter of the blood, hemin, led to a new class of chemical compounds.

A new kind of bacteria was discovered which ferments kerosene into ethane and methane.

By using a "tunnel" through a tank of water, a partial collimation of neutron beams, much needed in nuclear physics, was obtained.

Relatively large amounts of the heavy isotope of carbon were produced by chemical separation.

The highest useful pressures ever created in

the laboratory, 1,500,000 pounds to the square inch, were produced.

Two new explosives, nibglycerol trinitrate and nibglycol dinitrate, were produced out of the abundant raw materials of natural gas or coal, air and steam.

Thermal diffusion methods for the successful separation of isotopes were developed.

New indirect evidence suggesting the presence of the elusive neutrino particle, having the mass of an electron but without electrical charge, was reported.

Electrons were used to create atomic disintegration for the first time.

Triple weight hydrogen of mass three was made and found to be radioactive.

Large numbers of neutrons were discovered at altitudes of 70,000 feet by balloon experiments.

Variations in cosmic ray intensity have been found at high altitudes and attributed to the magnetic field of the sun or some other non-terrestrial cause.

A radiation pyrometer has been developed which measures ordinary temperatures without influencing the temperatures measured as former instruments have done.

Practical methods were developed for coating glass surfaces to eliminate unwanted reflections of light.

Sodium pentachlorophenate was introduced to preserve liquid rubber latex for long periods.

The speed of lightning strokes was found to be more than 22,000,000 miles an hour.

"Clouds" in the ionosphere radio reflecting layer, which attain velocities as great as 310 miles an hour, were demonstrated.

Five useful chemical products were created out of lignin, former waste product of wood.

A new electrical micrometer made possible measurements with an accuracy of .000005 of an inch.

An improved method of bombarding living materials with electrons of homogeneous energy was developed.

The world's most powerful magnetic alloy steel was developed and when used in a magnet, half the size of the eraser on a lead pencil, lifted five pounds.

An automatic electrometric titration apparatus was developed for analyzing chemicals.

A new method of making hydrogen peroxide was developed which requires only a third as much electrical energy as older processes.

Four, and possibly six, new types of soap solutions, some with potential commercial importance, were discovered.

The four new regional industrial research laboratories of the U. S. Department of Agriculture were dedicated, and organization of their staffs was commenced.

EARTH SCIENCES

Government-Sponsored Party Starts to the Antarctic

A Government-sponsored American expedition to Antarctica set sail in 1939, equipped with planes and a specially built snow cruiser, to amass geologic, geographic and oceanographic data and to collect zoological specimens and information.

A new method was developed for obtaining geologic data on the deep bottom of the ocean by means of TNT explosions.

A new type of "robot" unmanned observatory made possible the obtaining of weather

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