

portant materials. Two years ago Dr. Lavin made the first spectroscopic analysis ever done of an enzyme, pepsin.

In all, Dr. Lavin has investigated proteins both containing and deficient in aromatic amino acids and with varying concentrations of nucleic acid, problems which are virtually hopeless chemically. He has also examined the protein fraction of pneumococci, the causative agents of pneumonia.

Science News Letter, July 29, 1939

Predicts Sun Discoveries

IDENTIFICATION of three previously undetected molecules of matter, which can probably soon be found in the sun, was announced by Dr. H. G. Howell of University College, Southampton, England.

They are the oxides of iron, nickel and

cobalt, none of whose spectra has ever been reported heretofore.

If found in the sun, as Dr. Howell predicts, these will bring to 30 the number of molecules known to exist there and in all probability in all stars of a similar type. Several other molecular combinations thought most likely to be present have not yet been found, partly due to lack of laboratory data concerning them and partly because the properties of these molecules make detection exceptionally difficult.

The research was conducted with the spectrograph which analyzes the light given off by the molecules under examination. In investigating atoms, the strength of the spectral lines indicates their relative abundance but this phenomenon is not sufficiently trustworthy in the case of molecules, due to their peculiar properties.

Science News Letter, July 29, 1939

DENTISTRY

New Way of Using Toothbrush Introduced To Dentists

Scientist Says Back-and-Forth Brushing and Rotary Method Are Equally Harmful; Should Imitate Chewing

A NEW way of brushing teeth was introduced by Dr. T. Sidney Smith, of San Francisco, to the American Dental Association meeting in Milwaukee. Dr. Smith also stressed the importance of toothbrushing and of cooperation between dentist and patient in caring for the teeth.

"There is nothing more helpful in the daily care of the teeth and their investing tissues than the toothbrush when properly used," Dr. Smith declared. "At the same time, nothing has been so destructive of tooth structure by abrasion and has caused as much recession of investing tissues as stiff, ill-shaped brushes."

The child's way of brushing teeth horizontally back and forth and the rotary method are both harmful, according to Dr. Smith, because they cut grooves into the teeth in time. Slightly better, but not good enough, is the newer method of brushing away from the gums. This does no harm but neither does it do any good in Dr. Smith's opinion. He advises a method that follows the direction of the food in chewing.

"The main strokes of the bristles are guided upward over the upper teeth and

gums and downward over the lower; this is nature's way of cleansing and stimulating the tissues," Dr. Smith explained.

The brush he recommends is the plain old-fashioned one, of medium size, with small tufts of fine bristles arranged in four parallel rows and trimmed to an even length. Gentleness and time should be used, rather than force and speed, he indicated. He suggested that teeth, like dishes, should be cleaned after every use, but since this may not be practical, the bedtime cleansing is especially important because, he says, bacteria increase more rapidly in the mouth during sleep.

Science News Letter, July 29, 1939

Forecasting Life of Teeth

A MEASURING stick by which the longevity and future health of one's teeth can be forecast was proposed by Dr. Arthur L. Jensen, of the University of California.

Dr. Jensen's plan would allow dentists of the future, he believes, to answer the following questions: "What are your chances of outliving your teeth? Can your teeth last through life? Must you

go through life with tooth troubles? How long will your teeth last? What can be done to help you maintain a healthy mouth?"

The plan is based on individual measurement of the capacity of each tooth in the mouth and the tooth damage each person has sustained. From this is computed a "dental health capacity index" for the mouth as a whole. Dentists would pool information on many thousands of patients of the same age group who had the same kind of tooth troubles. In the course of years, a definite pattern of tooth history could be secured from which a person could know years in advance just what to expect.

Science News Letter, July 29, 1939

PHYSICS

New Device Traps Current in Lightning Bolts

ATOP the 42-story tower of the University of Pittsburgh's Cathedral of Learning is a spinning wheel that traps bolts of lightning, studies their electrical characteristics and then discharges them harmlessly through lightning arrestors.

The device spins at 3,400 revolutions a minute. In continuous operation since June 3, it turned over its 210,000,000th revolution July 15. In a normal lightning season of 200 days it will come close to a billion revolutions.

The device that willingly and purposely awaits the direct hits of lightning is called the fulchronograph. Designed



LIGHTNING TRAP

This device on the top of the 42-story tower of the University of Pittsburgh traps bolts of lightning and records their electrical characteristics.

by Charles F. Wagner and Gilbert D. McCann, Westinghouse engineers, the device is essentially a motor and a slotted aluminum wheel filled with laminated permanent magnet steel, projecting like fins from each side of the wheel and rotating through two coils which carry the total surge current from the lightning stroke being measured.

As the small fins pass between the magnetic field of the coils they are magnetized in proportion to the amount of current that is carried by the lightning stroke in time intervals as brief as 40 millionths of a second.

The fulchronograph gives a schematic picture of the wave shape and surges in a single lightning stroke. This is compared with the wave shape and surges created by artificial lightning bolts in the laboratory, and can be used to improve the protection of exposed power circuits.

First lightning stroke actually measured by the new device was found to last one-sixtieth of a second and showed a maximum current of 21,000 amperes, or enough to light 40,000 ordinary light bulbs.

Science News Letter, July 29, 1939

MEDICINE

Sulfanilamide, Wonder Drug, Now Cures 33 Diseases

Only in the Battle Against Common Colds and Influenza Are the New Chemical Remedies Apparently Valueless

THIRTY-THREE different disease conditions may now be cured by the new chemical remedies of the Protonsil-sulfanilamide-sulfapyridine group. In addition, these chemicals may be effective in preventing some of the ailments. Only in the treatment of colds and influenza are they apparently valueless.

The whole story of these amazing, new chemical remedies, what they can do, how they should be used, and their dangers is told for the first time by Drs. Perrin H. Long and Eleanor A. Bliss, of the Johns Hopkins Medical School, in a book just published for medical scientists by Macmillan. Drs. Long and Bliss were among the first to use these wonder-working remedies in the United States.

There are now, according to this book, eight drugs in the sulfanilamide group. They are: sulfanilamide itself, known also by the trade names of Prontylin, Streptocide, Prontosil Album and Lyso-coccine; Prontosil, also called Prontosil Flavum; Neoprontosil or Prontosil Soluble; benzyl sulfanilamide, also called Septazine and Proseptazine; sulfanilyl sulfanilamide, with the trade name of Disulon; sulfanilyl dimethyl sulfanilamide, called Uliron and Uleron; sulfapyridine, with the trade names of M & B 693 and Dagenan; and another compound known only by its chemical name 4,4'-diaminodiphenylsulfone.

Sickness caused by two kinds of streptococcus germs, by the gonococcus, the

meningococcus, and the pneumococcus has been successfully treated by these remedies. Recoveries from undulant fever, chancroid, typhoid fever, urinary tract infections, gas gangrene, chronic ulcerative colitis, trachoma, malaria, and the skin diseases, pemphigus and lupus erythematosus, have also been reported following treatment with one or another of these chemicals. In malaria, typhoid fever and undulant fever, the value of the chemicals has not yet been conclusively proved. Not many cases have been treated. Some doctors report good results and others poor results in these conditions.

Sulfanilamide, now used successfully as a remedy for childbed fever and gas gangrene, may become even more of a life-saver through use as a preventive of these serious illnesses. Drs. Long and Bliss believe any patient who suffers an injury which might result in the development of gas gangrene should be given prophylactic doses of the drug as soon as possible. Sulfanilamide also shows some promise of helping in the fight against rheumatic fever, the childhood ailment which affects the heart and causes many deaths among young people.

"Probably the greatest single instance of the misuse of sulfanilamide is in the treatment of the common cold," Drs. Long and Bliss declare. They explain that since colds and influenza are due to viruses, not bacteria, "there is little reason to believe that sulfanilamide will

be of any value in the treatment of these diseases, and we strongly advise against its use in these infections."

So far, all that is definitely known about how sulfanilamide achieves its cures is that this and related chemicals inhibit or check the growth of susceptible germs. A number of theories explaining the action of the chemicals in more detail have been proposed but, in the opinion of Drs. Long and Bliss, none of the theories adequately explains the action of the drugs.

Sulfanilamide and related compounds are not without danger. Stones in the kidneys are the most recently reported ill effect to follow one of these drugs, sulfapyridine. Few deaths, however, have followed the use of these drugs, except for the 76 or more which followed the tragic use of Elixir of Sulfanilamide Massengill. In these it was not the sulfanilamide but the deadly diethylene glycol, used as a solvent, which caused the fatalities. If proper precautions are taken in caring for patients receiving sulfanilamide or related drugs, serious ill effects will be noticed at their beginning, Drs. Long and Bliss state, and measures can be taken to lessen their severity and prevent a fatal outcome.

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ENGINEERING

Gas Turbines Practical In Generating Power

AN OLD DREAM of getting useful power from the direct expansion of burning gases without the bother of cylinders and pistons, fuel injection, and even cooling water is coming true practically. For over a century the turbine propelled by gas has been discussed; now it is coming into power-generating use.

Over a dozen gas turbines are now in actual use or being built here and in Europe. Power engineers are eyeing them with great interest and anticipation.

Just as steam in a steam turbine drives steel blades on a rotating shaft, delivering power without the reciprocating motion, so hot gas whirls the blades of the gas turbine.

It will not outmode immediately steam turbines, steam engines or Diesel and other internal combustion engines. But for special uses the gas turbine has great promise.

Because it needs no water for cooling (steam plants often need a thousand tons of cooling water per ton of coal burned) it is ideally fitted for operation away from rivers in arid areas, such as south-