

ENGINEERING

Drop of Oil Atomized Into 100,000,000 Particles

See Front Cover

A TINY drop of fuel oil no larger than the head of a safety match has been torn into 100,000,000 particles at the research laboratory of the General Electric Co., Schenectady, N. Y., it is announced.

Intensely hot combustion results at high efficiency. Engineers are expected to apply the discovery to a new oil furnace.

To effect this high temperature combustion, oil under pressure is brought into a direct head-on impact with air under approximately the same pressure, causing the superfine atomization and facilitating easy conversion of small particles into a gaseous hydrocarbon by heat.

Science News Letter, July 23, 1932

PUBLIC HEALTH

Pellagra Deaths Decrease In Spite of Hard Times

DEATHS from pellagra, often called the "hard times disease" because it is caused by a typical hard times diet which lacks certain vitamins, have, surprisingly, decreased during the recent hard times. A decline in the pellagra deathrate during 1930 and 1931 is reported in the current issue of the Statistical Bulletin of the Metropolitan Life Insurance Company.

Figures of the U. S. Public Health Service for 42 states also show a decline in pellagra deaths during these two years. Public health officials point out, however, that patients do not usually die of pellagra during the first or second year they have the disease. Consequently many cases may have developed within the last year or so which have not yet shown up in the mortality figures. Likewise, more is known about how to prevent or to treat the disease now than during previous "hard times." For example, several state health departments in the South are distributing free yeast, which is one good preventive of pellagra.

"The facts do not show that the higher mortality rates always come when business is at a low ebb," the insurance company's statisticians point out.

The pellagra deathrate declined dur-

ing the World War when employment was general and high wages prevailed. After 1924, when the lowest deathrate for the twenty-one-year period from 1911 to 1931 was recorded, the pellagra deaths began increasing.

"But in 1930 and 1931, in the face of widespread economic disturbances, deaths from pellagra declined quite in line with the general deathrate," the report concludes.

Pellagra may be prevented by vitamin G, found in fresh lean meat, milk, yeast and certain vegetables. Except for yeast, these are expensive foods and among the first to be dropped from the diet when finances run low. The typical hard times diet of the poor in the South, meal, molasses and salt pork, is entirely lacking in the anti-pellagra vitamin.

Digestive and nervous disturbances, skin irritations, extreme weakness, convulsions and even insanity are characteristic of the disease.

Science News Letter, July 23, 1932

ARCHAEOLOGY

Finds Ruins of American Home Dated 797 A. D.

FIRE-SWEPT ruins of a house containing timbers cut in the year 797 A. D. have been discovered at an Indian site near Allentown, Arizona, is the report just received at the Bureau of American Ethnology, Washington, D. C., from Dr. Frank H. H. Roberts, Jr., of its staff. The house takes rank as the oldest dated ruin in the Southwest.

The house was a pit house, built largely under ground, with an entrance through the roof. Such homes must have been fire-traps. The fire which destroyed the place forced the inhabitants to flee without salvaging their belongings. Dr. Roberts found everything still inside, including much pottery.

Antiquity of the house was determined by means of four timbers on the floor. The dates of the tree rings were read according to the tree-ring calendar worked out by Dr. A. E. Douglass of the University of Arizona. Dates previously established as the oldest in the Southwest were 919 A. D. from a beam found at Pueblo Bonito, then 861 A. D. from a piece of timber in Una Vida, both pueblos being in New Mexico.

Science News Letter, July 23, 1932

IN SCIENCE

ENTOMOLOGY

Butterfly's Legs Keener Than Man's Tongue

BUTTERFLIES' legs contain the insects' organs of taste, and they are far better than the human tongue at the job of detecting the presence of sugar.

At the University of Minnesota, Dr. Almeda Louise Anderson has been experimenting with a number of butterfly species, testing each for the most dilute solution of common sugar that would make it "put out its tongue," or more accurately, extend its proboscis. The taste "threshold" for different butterflies, or even for the same individual at different times, varied a good deal; but the most sensitive tasting legs were found finally on a common red-and-black monarch butterfly. They could detect sugar in a solution 1200 times more dilute than the weakest that would taste sweet to a human tongue.

A full statement of Dr. Anderson's results is to be published soon in *The Journal of Experimental Zoology*.

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CHILD STUDY

Children Growing Regularly Have Better Health

DO NOT worry if your child does not show a gain in weight every month in the year. But watch him to see that he does not go for long periods without growing.

Dr. Clair E. Turner, of the Health Education Research Laboratory of the Massachusetts Institute of Technology, and associates, Cambridge, Mass., found in a study of 1,000 school children that fewer than twenty of them gained weight every month of the school year.

When children who failed to show any gain in three months were compared with those gaining regularly, three times as many were found to have important unhygienic habits, twice as many had serious physical defects, and twice as many had had recent illness.

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E FIELDS

SEISMOLOGY

Another Earthquake Located Off Mexican Coast

ANOTHER in an unusual series of earthquakes visited Mexico on Tuesday afternoon (July 12) when a sharp shock centered in the Gulf of California southwest of the boundary between the states of Sonora and Sinaloa. Telegraphic reports to Science Service from seismological observatories interpreted by the U. S. Coast and Geodetic Survey allowed the location of the center of the earthquake. The earthquake recorded on the seismographs was not the same as the one which is reported to have caused damage some 450 miles further south.

The epicenter of the quake was determined as 25 degrees north latitude and 110 degrees west longitude, and it occurred at 2:24 p. m. E. S. T.

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PUBLIC HEALTH

Not Alfalfa, But Drainage, Prevents Malaria

ALFAFSA in itself is no preventive of malaria, but the drainage necessary to its cultivation in wet regions subject to floods may cause a reduction in the number of malaria cases in the vicinity, Dr. W. K. Stratman-Thomas of the International Health Division of the Rockefeller Foundation found in a survey in Mississippi.

The study was undertaken to determine whether there was any foundation for the assumption that the absence of malaria in certain areas of Egypt and other places was due to an antagonism between malaria and the alfalfa or other leguminous plants grown in those regions. The survey was conducted in Washington and Bolivar counties, Mississippi, among 1,858 tenant farmers.

The survey showed definitely that the amount of malaria in a vicinity is related to the amount of standing water in which the malaria mosquitoes can breed. People living adjacent to both standing water and alfalfa were not protected from malaria.

However, alfalfa will not grow well in very wet soil. Drainage is required in low-lying countries to make it grow. Therefore, wherever a decline in malaria coincides with the planting of alfalfa, it is due directly to the proper drainage necessary to obtain the best conditions for the cultivation of the alfalfa, Dr. Stratman-Thomas concluded in his report to the *American Journal of Hygiene*.

Science News Letter, July 23, 1932

ENTOMOLOGY

Wasp-Nest Census Taken; Only 402 Inhabitants Found

HOW MANY WASPS are there in a wasp-nest?

Anyone who has ever had the misfortune to disturb one of these explosively "touchy" insect cities would undoubtedly make an estimate of millions; but an actual count, made by Barbara J. Betz of the School of Hygiene and Public Health, The Johns Hopkins University, shows only 105 full-grown insects, with larvae and pupae in numbers to bring the total count up to 402. However, since the nest was taken in autumn, when the workers normally die off, it is considered probable that the summer population of the nest would be considerably larger.

The nest was an unusually large "paper-wasp" nest, inhabited by the common black-and-white hornets. It was brought in on a cold night, and pickled whole in alcohol for a year before it was taken apart for study.

The count of insects in all stages of development was small as compared with the total number of cells in the five paper combs which it contained: 402 individuals as against 3,195 cells. It is noteworthy also that most of the adult population consisted of queens and drones, with only 17 adult workers: this is a characteristic of the autumn condition of a wasp-nest, for then the workers are dying off, while the queens are mating and preparing for the winter sleep.

In the same nest Miss Betz found four foreign insects, including the common housefly, a true bug and a beetle. None of these species is parasitic on the hornets, nor habitually a sharer of its dwelling. It is assumed therefore that they were either accidental invaders or had been killed and brought home by the hornets for food.

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ZOOLOGY

Baby Orang Dies of Disease Thought Peculiar to Man

THE FIRST case of sudden death due to enlargement of the thymus gland in any animal lower than man in the biologic scale, has occurred in a baby orang-utan, Dr. Herbert Fox, pathologist of the University of Pennsylvania, has just reported.

Many sudden, otherwise unaccountable deaths in children, and some in adults have been attributed to enlargement of this gland in the chest. The theory is that when the gland enlarges it may interfere with the heart action, compress the windpipe or obstruct the large arteries and veins in chest and neck. In the baby orang, it was the heart that was embarrassed by the enlarged thymus. The thymus is part of the lymph gland system to which belong also the adenoids and tonsils. The sheep, which has the largest thymus of any animal, known as the sweetbreads, does not seem to be disturbed by its size.

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PHYSICS

Light Speed Not Changing, Investigation Indicates

NEW EVIDENCE that the velocity of light is a constant and not growing less with the passage of time is obtained by Dr. Olin C. Wilson of Mt. Wilson Observatory, Pasadena, through a study of the measurements of the standard meter bar made in 1892 and 1906.

Dr. Wilson looked into the matter of the constancy of light's speed because of previous reports by M. E. J. Gheury de Bray that direct measurements of the velocity of light tended toward smaller values in more recent years. Dr. Wilson therefore compared two measurements of the standard meter, the world's basic reference of length, made in terms of the wavelength of the red calcium line of the spectrum at an interval of fourteen years. No change was found. He also pointed out that variations in the velocity of light with time would cause curious results when observations are made from time to time with a prism spectrograph, due to the relation of index of refraction to velocity of light.

Dr. Wilson made his report to the British scientific journal, *Nature*, which had published Mr. de Bray's reports.

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