

NUCLEAR PHYSICS

**Russia's Atomic Explosion
May Have Been Accidental**

► IF THAT atomic explosion in Russia was accidental, it might have happened from a wrong estimate of the critical mass of uranium or plutonium, the amount of these fissionable metals that must be brought together to produce an explosion.

Scientists discussing this possibility, without revealing any USA secrets, however, observed that when the bomb metal is in water, actually less of it is needed to reach the state of an explosion than when it is a metallic hunk. This is because the water slows down, or "moderates," the neutrons that act as triggers to set off the material explosively. Slow neutrons are necessary to cause the fission.

The possibility is that the Russians working with the fissionable material overlooked this danger, even if it is no secret from them.

The famous Smyth report hints that the critical mass of the atomic bomb is between one and 100 kilograms or about two and 220 pounds, which are very wide limits.

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PSYCHOLOGY

**Don't Believe Rumors
Of A-Bomb Explosions**

► DON'T believe stories you may hear about bombs dropping in your vicinity even if you hear a loud noise. This is the warning of psychologists who have studied the psychology of rumor.

The announcement of the Soviet atomic explosion has filled many with vague fears. But these will not lead to panic unless something happens nearby to crystallize them. Such a happening might be some ordinary accidental explosion with loud noise and perhaps flames. With the vague fear held in mind, people might immediately jump to the conclusion that they were being bombed. Rumors might start. Panic could follow.

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ENGINEERING

**Drops from Spray Nozzle
Sorted, Counted by Device**

► THE thousands of liquid drops shot out of the nozzle of a spray drying machine can be sorted and counted rapidly and accurately by a new electronic device developed at the University of Wisconsin, the National Electronics Conference was told in Chicago.

The device is called a Pulse Length Sorter and Counter by the men who invented it, Prof. R. J. Parent of the institution's college of engineering, and Robert W. Schumann, a graduate student. It is of important practical use in a wide variety of

chemical and engineering industries ranging all the way from manufacturing soap powder to building gasoline engines, they stated.

Soap powders for laundry use are made by a spray-drying process, they said. Liquid soap is shot through a nozzle at the top of a tower and the drops dry into spheres as they fall. The new device enables the operator to adjust the nozzle to obtain a uniform soap powder product. In an internal combustion engine, the uniformity of the spray of the fuel injected determines the efficiency and economy of the motor's operation. The new electronic sorter-counter can be used in measuring and gaining the uniformity needed. Working details of the electronic instrument were presented to the meeting.

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MINERALOGY

**Old Oil Wells May
Yield 14 Billion Barrels**

► SALVAGING old oil wells may triple total yields in some cases, a petroleum expert declared in Golden, Colo. One of his colleagues estimated that oil from this secondary source might amount to 14,000,000,000 barrels.

By flooding old wells with water under pressure, R. C. Earlougher, Tulsa petroleum consultant, said that yields may range "all the way from 25% to 300% of the primary recovery."

These are the extremes and "additional data are needed before a fair estimate can be made," he explained to the petroleum production conference being held in connection with the seventy-fifth anniversary of the Colorado School of Mines.

The 14,000,000,000 barrel estimate of oil from such secondary techniques was made by Paul D. Torrey, president of Lynes, Inc. of Houston. Current estimates of U. S. A. "secondary oil reserves" are 7,000,000,000 barrels or more, he said, adding that he is "willing to venture the guess that the physically recoverable secondary oil reserve of the nation may be as much as twice this figure."

Although this represents a relatively small proportion of the total reserve, secondary operations "nevertheless are an important factor in the business of oil production in several states," he said.

Other salvage methods in addition to water flooding, are vacuum pressure, air and gas injection, and to a limited extent open mining. Application of all of them, Mr Torrey said, constitutes "a true conservation measure," not only in the older oil fields, but in the new fields as well because it prevents the waste of leaving hard-to-reach oil in the ground.

Foreign countries also have such secondary reserves, but so far "no systematic effort has been made to evaluate" them, he said.

Science News Letter, October 8, 1949

IN SCIENCE

ENTOMOLOGY-ARCHITECTURE

**Termites Just Love
Modern Architecture**

► ALTHOUGH the architects don't always see eye to eye on the subject, modern architecture is enthusiastically endorsed by termites.

Two features in particular which termites deeply appreciate are building close to the ground and the use of soil-filled masonry porches. These characteristic features of modern dwellings are well adapted to the termite scheme of things. They both help the insects to gain access to the toothsome woody parts of a house on which they thrive.

These and many more helpful facts are assembled in a pamphlet on the CONTROL OF TERMITES IN BUILDINGS which has just been published by the Connecticut Agricultural Experiment Station, New Haven, Conn. It is not always an easy matter to tell whether a building has been infested by the pests, according to entomologist Neely Turner, the author. Sometimes the termites will flaunt their successful invasion by flying around the house in swarms. More often they lurk invisibly in the woodwork, and can only be detected by poking in the right places with a sharp instrument that exposes the termite burrows.

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GENETICS

**Giant Apples Sought for
Data on Genetic Make-Up**

► AN outdoor sport that any number can play has been introduced in Geneva, N. Y. It is not called "The Big Apple", although it should be, because that is the object of the game: finding big apples.

It's easy as pie—apple pie. You don't have to be an athlete. All you have to do is to keep your eye peeled and every time you see a giant-sized apple carefully mark the tree and send off a postcard (not the apple) describing the fruit and giving the name and address of the grower.

The man who wants this information on giant apples, or sports, as they are called, is Dr. John Einset of the New York State Agricultural Experiment Station in Geneva. These unusually large fruits are studied for their uncommon genetic make-up.

Giant apples can be identified from these clues: the fruits are frequently twice normal size, flatter, and irregular. The tree on which they grow tends to be flatter and bushier.

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E FIELDS

VETERINARY MEDICINE

Animals Can Have Man's "High-Life" Diseases

➤ GOUT can invade the barnyard and cirrhosis of the liver strike the family's pet dog, the American Veterinary Medical Association in Chicago warns.

Chickens, turkeys and dogs may get these diseases even though they are teetotalers and do not indulge in the high living popularly considered a cause of gout and cirrhosis, the association points out.

Cancer, stomach ulcers, kidney trouble, rheumatic fever, tetanus (lockjaw), gall stones, heart disease, goiter, diabetes, rickets and nervous disorders are other diseases common to both man and his pet and domestic animals.

Some 90 different germ-caused diseases can be spread from these animals to man, who in turn occasionally gives his infectious diseases to his animals. Example of this, the association says, is the "strep" sore throat of humans which can cause mastitis in cattle.

Because of the dual nature of these diseases, medical and veterinary medical authorities and researchers are cooperating on an increasing scale to help solve common problems in both fields.

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ENGINEERING

New Aluminum Welding Process Speeds Operation

➤ A GREATLY improved process for welding aluminum was revealed by Battelle Memorial Institute of Columbus, Ohio. It utilizes a new pistol-shaped welding tool, through which filler metal in wire form is fed at controllable rates of speed, while the welding electric current is carried through the filler wire, forming an arc between its end and the work.

A sheath of argon or helium gas surrounds the arc and prevents air from coming into contact with the molten metal. Power may be supplied from a standard welding generator. The equipment includes both semi-automatic gun and full automatic equipment.

The process and equipment are the result of joint research conducted at this well-known industrial research center and in laboratories of the Air Reduction Sales Company at Murray Hill, N. J. This company manufactures oxygen, acetylene, inert gases and various types of welding equipment.

Aluminum plates one-eighth to three inches or more in thickness can be welded with the new process, which is to be known

as "Aircomatic." The operation is claimed to be at least four times faster than any previously known process of welding aluminum which produces welds of equal quality. It requires less skill. No solid fluxes are required. There are no slags to be cleaned from welded joints, and the welder's work is not interrupted to change electrodes. Welds can be made in any position, flat, horizontal, vertical, or overhead.

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PLANT PATHOLOGY

Diseased Corn Suddenly Increases

➤ A SUDDEN increase of a hitherto minor corn disease for which no cure is now known has been observed by Dr. G. W. Boewe of the Illinois Natural History Survey, Urbana, Ill.

The disease, which causes the corn stalk to rot and collapse, was first found in Arkansas in 1920. It has been known in southern Illinois since 1922, but its appearance has always been local and sporadic. This season observers reporting to Dr. Boewe note a sudden trend northward.

Bacterial stalk rot, as it is called, has in no known cases attacked more than four percent of the stalks in a given field. In the U. S. Department of Agriculture's PLANT DISEASE REPORTER, Dr. Boewe summed up the situation in these words:

"No control measures are known. At present the disease is not sufficiently abundant in most places to require control. However, the fact that it has suddenly appeared in greater than usual amounts over a much larger part of the State suggests that it ought to be watched carefully. We shall appreciate receiving additional reports and samples."

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PHYSIOLOGY

Knee Jerk Reflex Depends On Height to Age of 20

➤ HOW fast your foot jerks forward when the doctor strikes your knee to test your knee jerk reflex is directly proportional to your height if you are between six and 20 years old. After the twentieth year, the reflex time is longer in proportion to height than it is for the immediately younger years.

These findings, and a formula for predicting the knee jerk reflex time from body height without regard to age, were reported by Drs. G. Clinton Knowlton and Louis P. Britt of Emory University School of Medicine at the meeting of the American Physiological Society in Augusta, Ga.

The results, they said, suggest that after age six the big feeling and moving nerve axones grow only in length and do not get any larger in diameter.

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ENGINEERING

English Reveal New Type of Wind Tunnel

➤ SOMETHING new in wind tunnels for aviation research has been revealed. It is a "straight-through" tunnel, powered with a standard turbo-jet engine widely used in airplanes. It is a development of the English Electric Company, London.

The engine is installed at the terminal end of the tunnel, and acts as an air ejector. The working air current in the test section of the tunnel is due to the suction of the ejector. Most wind tunnels employ the "closed-circuit" principle in which air is forced around and around the endless tunnel by means of powerful compressors. This new tunnel is straight. The air is not reused. It is sucked into the forward end and discharged into the atmosphere at the rear.

The engine employed is a Rolls-Royce Nene, which has a static thrust of 5,000 pounds. The Nene is housed in a nacelle carried in a bulge of the tunnel. A space is left between the inner nacelle and the outer wall through which two-thirds of the tunnel air is drawn by the ejector action of the jet. The remaining one-third of the air is drawn direct into the engine. When no model is in the working section, a rate of airflow nine-tenths the speed of sound can be obtained. The English Electric Company is now working on a wind tunnel to give much greater speeds, using no more power than that available from a Nene turbo-jet engine.

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VETERINARY MEDICINE

No More Puny Pigs—Cause and Cure Found

➤ THE cause and the cure of a mysterious ailment that produces puny pigs has just been announced. The cause has eluded veterinarians for years.

The illness has doomed thousands of pigs each year to fail to achieve adult stature, an expensive loss to farmers. It produces an inflammation of the digestive tract, the animals fail to gain weight and consequently are a total loss as porkers.

The condition arises, the American Veterinary Medical Association reports, from a protein and vitamin deficiency in the diet. Piglets fed a low-protein diet lacking essential B vitamins develop the inflammation, a form of swine enteritis, and suffer from scours, a form of diarrhea.

A high-protein diet alone does not cure the condition. When in addition B vitamins are injected, the animals promptly respond. They get back their appetite, put on weight, and are well on the way to market. The vitamins used are niacin, calcium pantothenate, and in some cases, riboflavin.

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