

## PSYCHIATRY

**Birthdays Remembered Under Hypnosis**

► CAN you remember on which day of the week your birthday fell when you were four years old, or seven or 10?

Probably not, but if you were successfully hypnotized by a psychiatrist, you probably could.

More than 40 of a group of 50 persons, 10 women and 40 men, were, when hypnotized, able to recall correctly the days of the week for their birthdays and for Christmas when they were four, seven and 10 years old, Dr. Robert M. True, of the University of Vermont College of Medicine, reports in the scientific journal, *SCIENCE* (Dec. 2).

An extremely small percentage gave the correct answers to any of these questions before hypnotic induction, he reports. The percentage was so small that when correct answers were given it was probably by chance.

Dr. True's study was done to develop a simple, practical test to tell the psychiatrist whether a patient being psychoanalyzed under hypnosis has really gone back to his early childhood and is telling what happened then and reliving those experiences, or whether he is telling and acting out experiences in his current memory.

For the psychiatrist to have a method of distinguishing between a real childhood state under hypnosis and a half-pretended one is important, Dr. True points out, because recall of actual hurtful experiences is more beneficial in treating a neurosis than the reliving of an imagined experience.

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## DENTISTRY

**Brush That Sweet Tooth To Avoid Decay**

► IF you have a sweet tooth, and want to satisfy it, use toothbrush and mouth rinse immediately afterwards to avoid tooth decay. Better use toothbrush and mouth wash after any meal.

This advice, bringing the fight on caries full circle back to the clean tooth idea, comes from studies by Drs. H. W. Haggard and Leon A. Greenberg of Yale University.

These scientists are physiologists, not dentists. They take the view that if sugar is a cause of tooth decay, regardless of the mechanism by which it affects teeth, the magnitude of its effect will be related to the concentration of sugar in the mouth and particularly to how long it stays there.

A caramel and orange juice, they found, both brought the sugar content of the saliva up to almost the same high point of 800 mg per 100 cc. But 20 minutes after the orange juice, there was almost no sugar left from it in the saliva, whereas 45 minutes after the caramel, there was still considerable sugar left from it.

Thoroughly brushing and washing teeth

and mouth after eating the caramel, however, immediately brought the sugar concentration in the saliva to the zero baseline.

Trying to avoid tooth decay by avoiding sugar, the Yale scientists point out, is impractical, because almost all starch food-stuffs produce sugar in the mouth, and micro-organisms involved in tooth decay make no distinction as to the source of the sugar.

A mixed meal, for example, brought the sugar concentration in the saliva to more than 600 mg per 100 cc, and it took 45 minutes before the sugar had dropped to the point reached 20 minutes after the orange juice.

Their tests, reported in the *DENTAL SURVEY*, were made at five, 10, 20, 30 and 45-minute intervals after eating each of the following: a mixed meal, fresh orange juice, grapefruit juice, ice cream, crackers, chewing gum, caramel candy and sweetened bottled soft drinks.

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## ENGINEERING-AERONAUTICS

**Fire-Resistant Hydraulic Fluid Is Approved**

► THE need for a fireproof fluid for use in aircraft hydraulic mechanism to operate landing gear and other parts will be met, in part at least, by a new fire-resistant synthetic liquid that the Civil Aeronautics Administration has now approved for use in certain planes.

This new hydraulic fluid, known as Skydrol, is a joint development of Monsanto Chemical Company, St. Louis, and Douglas Aircraft Company of Santa Monica, Calif. Its approval is for use in DC-4 and DC-6 transport planes. Later approval is expected for other planes, Monsanto officials state.

The hydraulic system of a modern plane by means of which controls and flaps and other parts are operated from the pilot's cabin includes much tubing leading to various sections of the plane, as well as pumps and valves. The pressure in the tubes may be as high as 3,000 pounds per square inch. If a leak should develop in the system, the hydraulic fluid would escape into near and far-away places in the plane. If combustible, it would then be a fire hazard. It would be an extreme hazard in a plane crash.

A hydraulic fluid requires a unique combination of chemical and physical properties. It must be a suitable lubricant for the pumps. It must be non-corrosive to avoid attacking the various metals in the system. It must not undergo undue thickening at low temperature and thinning at high temperature. It has to be light in weight to avoid adding undue weight to the plane. In addition, it should be highly fire-resistant. Skydrol is claimed to meet all these specifications.

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**IN SCIENCE**

## ENGINEERING

**First Coal-Burning Gas Turbine To Be Tested**

► AMERICA'S first coal-burning gas turbine locomotive will be ready for testing before the end of the year, it was revealed by Dr. John T. Rettaliata of the Illinois Institute of Technology. It is being built by the Allis-Chalmers Manufacturing Company.

An American gas turbine locomotive using oil for fuel has been in use since early summer. Several coal-burning gas turbines are under development. Coal is a highly desirable fuel for locomotives because it is plentiful and well distributed for railroad use. Present coal-burning steam locomotives are on the way out, being replaced by the more efficient diesel. But diesels use oil for fuel.

This Allis-Chalmers coal-burning gas turbine locomotive, like the oil-burner in use and like most of the diesel locomotives, uses the prime power to develop electricity for the driving power. As described by Dr. Rettaliata, in the new locomotive air from the atmosphere is compressed and passed through a combustion chamber where its temperature is raised to about 1,300 degrees Fahrenheit by the burning of pulverized coal. It enters the turbine in the form of a hot gas. By expansion of the gas through it, the turbine develops power both for the compressor and the electrical generator.

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## POPULATION

**Birth Rate Is Third High in 25 Years**

► IF you think almost every young couple you know had a baby this year, you are not far off. During the first nine months of the year births of 2,669,000 babies were registered, the National Office of Vital Statistics estimates on the basis of figures now available.

This gives an estimated birth rate for the first nine months of 24.1 per 1,000 population, which would mean, in round numbers, one baby for every 20 couples if every 1,000 population were made up of 500 couples. Actually, the per 1,000 population figure includes some children and old people.

The birth rate this year is almost the same as for the corresponding period of 1948, which was 24.2, the second highest for the January-September period in over a quarter of a century.

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# E FIELDS

## BIOCHEMISTRY

### Radioactive Ground Moles Help Fight Against Polio

► RADIOACTIVE ground moles will help fight infantile paralysis and cows will, perhaps contentedly, swallow radio sulfur to show scientists more about milk protein synthesis.

These are among research programs utilizing radioactive materials from the Atomic Energy Commission's pile at Oak Ridge, Tenn. The physical research division of Eli Lilly Company at Indianapolis, Ind., hopes to tag the ground moles with radiocobalt to find out where they burrow, the distances they travel and other habits. If the moles can be tagged and more learned about them, they may become useful animals for infantile paralysis research since they will live in their natural state and not under laboratory conditions.

Radiosulfur-fed cows are expected to tell scientists at Lankenau Hospital Research Institute, Philadelphia, and the Borden Company Laboratory, Scarsdale, N. Y., to what extent sulfur-containing amino acids for protein in milk are formed in the rumen, or first stomach of the cow.

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## MEDICINE

### Oxygen Lack Reduces Radiation Cell Damage

► X-RAY damage to the hereditary cells of plants, similar to that which atomic radiation causes, can be greatly diminished by eliminating the surrounding oxygen, say two Oak Ridge scientists, Drs. Norman H. Giles, Jr., and Herbert Parkes Riley.

These findings, while not directly applicable to humans, have possibly important implications for medical research.

In an attempt to confirm recent reports of an oxygen-radiation damage relationship, the two biologists subjected the plant *Tradescantia* to X-ray bombardment while it was in different mediums, namely oxygen, nitrogen, and air. They found that changes in the chromosomes, seat of the genes which control heredity in plants, animals and humans, were greatest when the plant was in oxygen and least when it was in nitrogen.

To make sure that it was not the gases which were causing the "chromosomal rearrangements" they placed plants in each of the mediums without applying X-rays. They found that the gases alone did not produce the effect.

In all tests with X-rays they found that absence of oxygen lessened cell damage. Besides nitrogen, they tested the plants in helium and argon. Each time the damage

was less than when the plants were X-rayed while in oxygen.

Drs. Giles and Riley, reporting their findings in the PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES (Nov.), do not know whether the oxygen affects the actual chromosome breakage or the later recovery process.

Another government scientist who commented on their report, tentatively favors the theory that the absence of oxygen slows down the movement of the chromosomes. This, he believes, aids the repair of X-ray breaks, while the presence of oxygen permits and perhaps speeds up cell movement, thus preventing breakage repair.

He pointed out that if this is the case the discovery would not be of much immediate application in preventing human chromosome damage in the event of an atomic burst, because in the absence of oxygen a man would soon die.

He suggested, however, that other methods may be devised to slow down cell division, such as low temperature or chemicals. He stressed that this was still highly conjectural, but that such problems would probably be solved eventually by research in atomic medicine.

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## MATHEMATICS-ENGINEERING

### Giant Brains Are Explained in New Book

► ADD "cybernetics" to your modern vocabulary. It is a new coined word which applies to the science of control and communication in the animal and the machine. The term is used by the scientists who developed the giant electronic and mechanical computers that are now solving problems in seconds that would require many months with pencil and paper.

These machines are complicated affairs, well beyond the understanding of the ordinary human. A popular explanation, however, is now available. It is in a new book just published, GIANT BRAINS, OR MACHINES THAT THINK (John Wiley and Sons, Inc.). The author is Edmund C. Berkeley, an authority on the subject.

There are several of these computers now in use in the country, and more under development. They include Harvard's Mark I, II and III; the differential analyzer at the Massachusetts Institute of Technology; the Bell Telephone Relay Calculators; the so-called ENIAC developed at the University of Pennsylvania, and BINAC built by Eckert-Mauchly Corporation, Philadelphia. One of the newest is the BEMAC, built by Boeing Airplane Company, Seattle, Wash., and used to determine how a guided missile will behave on an imaginary flight in the air without even being shot into the air at all.

While the new book is entitled GIANT BRAINS, the computers are not brains at all. They do no thinking. With the use of hundreds of electronic tubes, electric relays and special mechanisms, they fol-

low instructions fed into them in electric code to find the answers of problems, also fed into them in code. They are unlike the punch-card machinery used by hundreds of businesses today. They use reels of magnetic tape coded in a language of their own. They are machines that handle "huge quantities of information automatically."

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## AERONAUTICS

### Nitrogen Tetroxide Is a Top Rocket Aid

► A LONG known but little used chemical, nitrogen tetroxide, promises to become a number one aid in rocket propulsion, the American Rocket Society was told by Douglas H. Ross of Allied Chemical and Dye Corporation, New York.

Nitrogen tetroxide is not a fuel. It is an oxidizer to provide the necessary oxygen for combustion. It is a chemical of high oxygen content. It is about 70% oxygen and it is capable of releasing the entire amount under such rigorous conditions as encountered in a rocket motor.

It is a chemical easily made from ammonia. It can be produced in abundant quantities. Some 500,000 tons annually could be made in the United States if only 10% of the present ammonia output were converted to nitrogen tetroxide.

Rockets, unlike all other types of jet-propulsion, can operate miles above the earth where there is not enough oxygen in the air to support combustion. It carries its own oxygen, either mixed with the fuel or in separate containers to mix in the combustion chamber. Finding an efficient oxidizer is as important as finding an efficient fuel.

Nitrogen tetroxide, Mr. Ross stated, has high chemical stability, high density, low freezing point, and little susceptibility to decomposition.

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## MEDICINE

### Warning Issued Against Anti-Histaminics Use

► A WARNING against "indiscriminate use" of the anti-histaminic substances now available at drug stores in anti-cold pills has been issued by the American Medical Association.

The A.M.A. is not convinced that there is enough evidence yet to warrant the claims being made on anti-histaminics for colds. Also, A.M.A. records show that about one-third of those taking these drugs become drowsy or fall asleep at work.

Possibility of harm when the drugs are taken over long periods and of people taking too much in case of persistent colds are other points made.

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