

## ELECTRONICS

**Electronic "Brain" to Use Speedy Tubeless Circuits**

► A MINIATURE electronic "brain" for jet planes and guided missiles that would operate, without vacuum tubes, ten times as fast as present tubeless computers is being built in Philadelphia.

Tiny transistors tied together in a circuit known as "direct coupled" would do the trick. The "brain" using this method will be known as TRANSAC, short for "transistor automatic computer."

Leslie J. Woods, director of research and engineering for Philco Research and Engineering Laboratories, Philadelphia, explained that the size, weight and cost of such a computer would be about one-third that of other tubeless computers.

Mass production of such computers making calculations at "phenomenal" rates is expected to result from perfection of the direct-coupled circuit. Speeds would be "adequate for all military operations in the foreseeable future," Mr. Woods said.

A computer built using the new method would perform 600,000 additions or subtractions a second. "Surface-barrier" transistors make possible use of direct-coupled circuits.

Transistors do not generate heat, as vacuum tubes do, and therefore require less space. Their action is faster and, in the new device, power is cut to a thousandth of that for an equivalent computer with vacuum tubes.

In packaging a computer using direct-coupled circuits, all elements required for addition, subtraction, multiplication and division, as well as control circuits used in common, are combined on a single replaceable unit having on it only transistors and resistors. These units are printed wiring "cards."

Simple digital computers, small in size, combining small power requirements with high operating speeds are now possible, Mr. Woods said.

He foresees use of direct circuitry in industrial control devices and high-speed, low-power switching systems as well as in computers.

Science News Letter, April 2, 1955

## ANTHROPOLOGY

**Man Learned to Walk To Survive in Trees**

► THE ANCESTORS of man may have developed a way to stand upright and walk the earth, not as a means of living a new life on the ground, but in order to preserve the ancestral way of swinging from the tree tops.

This suggestion was made by Dr. W. E. Le Gros Clark, anthropologist at the University of Oxford, England, in his new book *The Fossil Evidence For Human Evolution* (see SNL, March 12, p. 172). Deforestation is no new thing, Dr. Clark pointed out. And even before modern man began,

it became necessary for his apeman ancestors to cross grasslands in order to get from one shrinking wooded area to another.

He also suggested that perhaps water-living backboned animals first gained terrestrial and air-breathing adaptations, not to fit them for life on land but as a necessary way to preserve their aquatic way of life. In times of bad drought, these new adaptations would make it possible for the creature to escape from dried-up rivers or pools and go overland in search of water elsewhere.

Man is not so ancient as some scientists have believed, Dr. Clark concluded. In terms of his body structure, man is no more "unique" than other mammal families.

There is no sound reason for believing that modern man first appeared on earth earlier than the Pliocene geologic period, according to Dr. Clark. This would mean that man first walked the earth not more than 12,500,000 years ago.

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## ANTHROPOLOGY

**Chinese Resume Digging At Peking Man Site**

► AFTER A 12-year interruption, digging has been resumed at Choukoutien in north China in a search for remains of Peking Man and possibly of an even older ancestor of modern man.

Work is being conducted under sponsorship of the Communist Chinese government and under direction of the Laboratory of Vertebrate Paleontology of Academia Sinica. Five teeth are among the new finds of Peking Man. An upper arm bone and lower leg bone, unearthed before the Japanese invasion, have been identified as Peking Man remains.

Reports of the important finds at Choukoutien and others unearthed in West China were made in *American Anthropologist* (April) by Dr. Hallam L. Movius Jr., Harvard University anthropologist. He dug out the information from a Communist China propaganda sheet "China Reconstructs" and from Russian reviews of reports of Chinese scientists. The original scientific reports are not available in this country.

The finds in West China are important because they are the first fossilized human bones found in that part of China. The bones are of part of the skull of a little 10-year-old girl who lived in late Pleistocene times. The skull is believed to be of the *Homo sapiens* type, and is probably more than 10,000 years old.

This is the first evidence that modern man lived in China so long ago. It is hoped that the skull can be dated more exactly from the remains of walnut and oak trees found in the same strata of sand and fine gravel in which the human bones were located.

Find of the little girl's remains was made by Dr. Pei Wenchung, a paleontologist well known in the West who has been identified with research on Peking Man.

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**IN SCIENCE**

## MEDICINE

**30 Cups of Coffee Daily Are Probably Harmless**

► AN OK on heavy coffee drinking for healthy persons has come from the American Medical Association.

"Drinking 20 to 30 cups of coffee a day probably wouldn't hurt you unless you were not completely healthy to begin with," was the association's report of opinions given by two consultants in answer to a query from a Connecticut physician. Query and answers appear in the *Journal of the American Medical Association* (March 19).

Nervousness, trembling, insomnia, headache, rapid pulse (tachycardia), extra heart beats, excessive water loss through the kidneys, and ringing in the ears and flashes of light before the eyes are symptoms one consultant gave as likely to result from the two to three grams of caffeine in 20 to 30 cups of coffee.

"In healthy persons these effects ordinarily are not serious and disappear promptly if the use of coffee is stopped," this consultant wrote.

He cautioned that in persons with organic disease such as heart, blood vessel, stomach, intestinal or nervous disease, "these effects may be harmful and the excessive use of coffee should be avoided."

The second consultant pointed out that anyone who has to ask his doctor whether he is being harmed by drinking 20 to 30 cups of coffee a day is surely not feeling any symptoms of harmful effect.

Science News Letter, April 2, 1955

## PALEONTOLOGY

**Australian Skull Is 8,000 Years Old**

► AN ANCIENT skull found near Melbourne, Australia, has been dated as between 8,000 and 9,000 years old.

The age of the skull had baffled leading scientists. Some estimates put the skull's age at 150,000 years. Now it has been dated in the United States by the radiocarbon dating method, R. T. M. Prescott, director of the National Museum of Victoria, announced.

Edmund D. Gill, curator of fossils at the Museum, made a special study of the Maribyrnong River Valley where a workman unearthed the skull.

The radioactive content of the charcoal from a fire lit by one of the ancient tribe of aborigines who frequented the valley long before the Christian Era determined the age of the skull at 8,500 years plus or minus 250 years.

Science News Letter, April 2, 1955

# CE FIELDS

## TECHNOLOGY

### Count Smog Particles Thousand Times Faster

► MICROSCOPIC PARTICLES in smog, factory smoke and cigarette smoke, can be counted and sorted a thousand times faster than by conventional methods with an electronic counter.

In the device, tiny droplets suspended in such gases are diluted and blown past a thin light beam. Droplets are counted and sorted into 12 size classifications at the rate of 150 per second.

Ordinarily these tiny particles are counted and analyzed on microscopic slides, a time-consuming technique.

Development of the electronic counter was sponsored by the U. S. Army Chemical Corps at Camp Detrick, Md., and disclosed at a meeting of the Institute of Radio Engineers in New York by Ernest S. Gordon of the Armour Research Foundation of the Illinois Institute of Technology.

Science News Letter, April 2, 1955

## OCEANOGRAPHY

### Undersea Swimmers Can See Hot and Cold Water

► AN UNDERWATER swimmer, equipped with an Aqua-lung, fins and goggles, can see the difference between hot and cold sea water.

Employing the popular sport of skin diving, scientists at the Scripps Institution of Oceanography, La Jolla, Calif., report that swimmers have been able visually to detect and to describe temperatures and other physical characteristics of underwater masses.

Investigations off the coast of California showed that skin divers can spot thermoclines, the layers of water which mark the sharp change in water temperature, in three different ways:

1. By observing the vertical distribution of the sea life and other suspended particles, and finding the line of demarcation between the warm turbid water and clear cold water.

2. By viewing the refractory plane between two bodies of calm water of different temperature and density. Here, the scientists found a "mirror" pool of cold water at a depth of 100 feet that had a refractive-index differential great enough to reflect an image of some kelp growing in warm water alongside the pool.

3. By the "stream" lines, like those of heat waves from a radiator, formed during the mixing of water masses of different density. In this instance, the scientists found a convex tongue of dense water four feet high and 10 feet wide at a depth of 60

feet. When the semi-bubble of cold water was penetrated, it looked like two liquids of different densities mixing, such as is seen when colorless alcohol is poured into water.

Findings by human divers can be helpful where the use of instruments is difficult or inconvenient, state Conrad Limbaugh and Andreas B. Rechnitzer, who reported the use of skin diving as an aid to underwater studies in *Science* (March 18).

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## TECHNOLOGY

### Liquid Form Makes Nylon Rival Leather or Rubber

► NYLON, FAMOUS in thread form, will appear in bottles on the wholesale materials market if the plans of a company, founded on the silk trade, work out in the field of modern plastics.

The new, tempered form of nylon, named Nylon 8 by the Du Pont Co., is a liquid. It can be molded into fuel tanks, pipes, gaskets and seals, taking the place of rubber or helping rubber resist the solvent action of certain oils and other organic chemicals.

Flowed and hardened into sheets, the new form of nylon can be made into luggage, belts and other "leather goods" specialties, where nylon's long-lived toughness will be important.

As an adhesive liquid nylon can bond wood, metal, glass and paper, and may add to the number of non-woven fabrics. Colors can also be made to stick to plastics, through the medium of the liquid nylon, giving greater variety to designs that can be printed on plastic materials.

The Belding Corticelli Industries, founded in the days of the China silk trade, has been licensed by Du Pont to manufacture and market the new form of nylon. The company has equipped its plant at Putnam, Conn., to turn out the plastic in granular and pellet as well as liquid form.

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## MILITARY TACTICS

### Helicopter Can Sweep Minefields, Saving Lives

► HELICOPTERS CAN now sweep minefields with a new technique that would eliminate the danger to crews of seaborne sweepers, which may themselves be blown up by mines.

Huge Piasecki H-21 "Work Horse" helicopters, manufactured in Morton, Pa., are able to haul minesweeping equipment faster than regular sweepers and add extra maneuverability. The H-21, which is cradled between two rotors, one in the front and one in the rear, can also operate in waters that may be too rough for small ships. By flying nose-downward, the helicopter pulls several times its load lift capacity.

The "whirlybird" minesweeper could clear an initial path, allowing the formation of minesweeping vessels to finish the job without danger from moored charges.

Science News Letter, April 2, 1955

## OPHTHALMOLOGY

### New Eyesight Test Spots Moving Objects

► A NEW test for eyesight, especially suitable for airplane pilots, was reported by Dr. Elek Ludvigh of the Kresge Eye Institute, Detroit, at the meeting of the Aero Medical Association in Washington.

The ordinary test in which you sit in a chair and see how many letters you can read on the Snellen chart across the room is good for determining whether your eyes are so farsighted, nearsighted or astigmatic that you need eyeglasses. But, Dr. Ludvigh said, fliers need also to be tested for ability to see moving objects.

He calls this kind of seeing "dynamic visual acuity." Most persons develop enough of it for ordinary purposes, such as seeing automobiles coming toward us at an angle. For fliers the ordinary kind may not be good enough, and some fliers may have less than ordinary dynamic visual acuity. Two people may have the same "static" or non-moving visual acuity and yet have very different dynamic visual acuity, Dr. Ludvigh found.

A simple way of testing dynamic visual acuity is to view a stationary Snellen letter or other test object through a rotating mirror or prism. In some persons, the visual acuity decreases with the speed of the rotating object. They cannot follow it as fast and accurately as others.

Now that this dynamic visual acuity can be tested, Dr. Ludvigh thinks it can be used to select flying personnel.

It should also be possible, he said, to use training procedures to improve this kind of eyesight and to test the results achieved.

Science News Letter, April 2, 1955

## AGRICULTURE

### Fruit for Northeast Resembles Loganberry

► A NEW fruit, as yet unnamed, is being tested for its possible distribution throughout northeastern United States.

Resembling the loganberry of the West, the new fruit is a cross between raspberries and blackberries. It was developed because other hybrids of the berry family, such as loganberries and Nessberries, do not survive in the Northeast.

Dr. John Einset and Charlotte Pratt of the New York State Agricultural Experiment Station in Geneva, N. Y., found that the fruit from a cross between the Hailsham red raspberry and the Erie blackberry resembled both raspberries and blackberries in flavor, with some tasting more like just blackberries.

Berries of the new fruit are described by its developers as from one-half to almost an inch in length, from round to oblong in shape and dark red in color. The seedlings ripen over a two-week period in mid-July.

Further testing will be required before the new fruit can be named and distributed.

Science News Letter, April 2, 1955