

## GEOPHYSICS

**Sun Has Weak Magnetic Field**

THE SUN has a weak magnetic field, measured at about one gauss, Dr. Horace W. Babcock of Mt. Wilson and Palomar Observatories, Calif., reports.

He confirmed this figure for the sun's general magnetic field in *Nature* (Sept. 8). In doing so, he differs with another prominent scientist, Dr. H. Alfvén, who believes that present methods of measurement are not sufficiently precise to show the amount of the sun's magnetism.

Both scientists agree, as has been known for many years, that sunspots often have strong magnetic fields. What they disagree about is the background, over-all solar magnetic field.

Dr. Babcock's measurements of this field are made daily, weather permitting, with a solar magnetograph at the Mt. Wilson Observatory. A gauss is the unit used by scientists to measure magnetic induction. (See SNL, Feb. 27, 1954, p. 132.)

Science News Letter, September 22, 1956

## PHYSIOLOGY

**Two-Thirds of Dust Breathed Stays in Lungs**

➤ ALMOST TWO-THIRDS of the dust taken with each breath of air may stay in the lungs. Also, breathing characteristics may determine how much dust is taken into the lungs.

These findings, with their implications for problems of air pollution, radioactive fallout and the so-called dusty trades, were reported by Drs. P. E. Morrow, D. A. Morken, L. J. Casarett and E. Mehrhof of the University of Rochester School of Medicine and Dentistry at the American Physiological Society meeting in Rochester, N. Y.

In their studies, human volunteers breathed air containing harmless dust in particles too small to be seen with a microscope. The dust in each person's breathing tract was then measured.

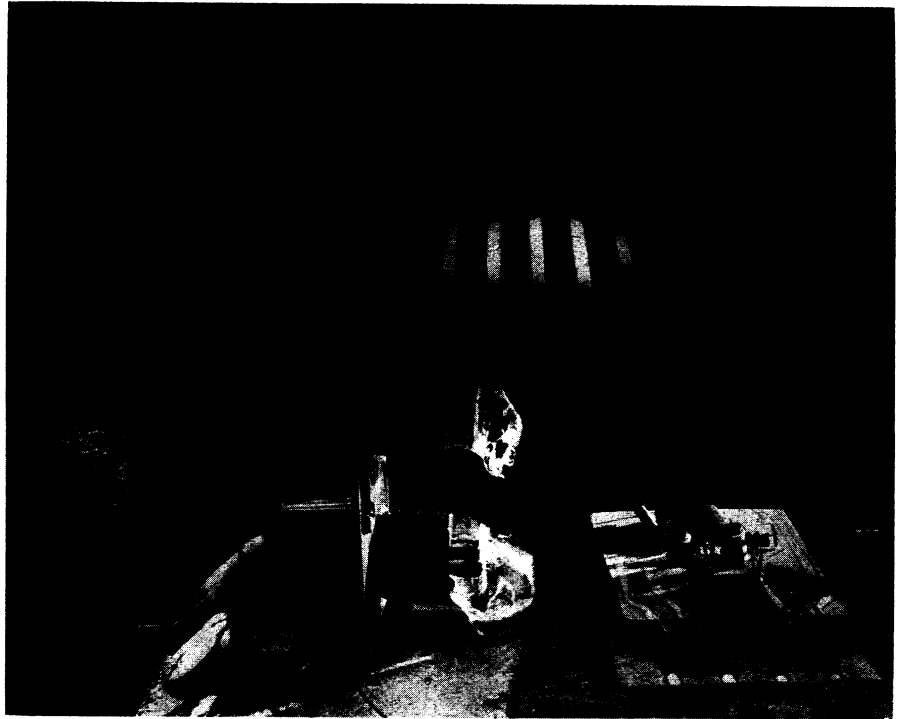
For the particular dust used in the studies, almost two-thirds of that breathed in stayed in the respiratory tract. This is a much higher value than can be estimated from existing relationships between particle size and deposition.

The frequency of taking breaths, the amount of air moved by a single breath and the air flow rate of breathing are related to the quantity of dust deposited, the scientists found.

This means it may be possible to estimate a person's susceptibility to getting dust in his lungs, which would be helpful in connection with working in dusty industries.

The same harmless dust used in the human studies is now being used in animal studies. The scientists hope through this to be able to extend the studies to learn more about dust contaminated with radioactive substances and its deposition in the lungs.

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**HEAT-RESISTANT ELECTRONICS**—In this side-by-side comparison an ordinary electronic circuit is shown with a new General Electric high-temperature circuit after being placed in an electric oven at 1,500 degrees Fahrenheit. The ordinary circuit has disintegrated, but the new one has operated at this high temperature for thousands of hours.

## TECHNOLOGY

**High-Temperature Devices**

➤ THE ELECTRONIC AGE can now run "red hot" since electronic devices and circuits have been developed that operate successfully at 900 to 1,500 degrees Fahrenheit. This is far above the 200-degree upper-heat limit of most conventional electronic equipment.

Most immediate consequence of the new General Electric development is that guided missiles and supersonic aircraft will be able to surmount the heat barrier encountered at high speeds and altitudes.

Ultra-speed planes now have to carry weighty cooling apparatus to counteract skin-sizzling heat generated by air friction at high speeds. Both electronic gear and pilots must be kept cool enough to operate. With tubes and circuits that stand such heat, the "brains" to run planes and missiles can be entirely electronic without worry about cooling.

The new electronic circuits will also operate for periods of up to 1,000 hours while exposed to intense nuclear radiation in an atomic reactor.

Inside glowing electric furnaces and surrounded by blazing blowtorches, General Electric's new vacuum tubes, capacitors, resistors, transformers, inductors, wires, printed circuit boards, and even an electric motor, operate at temperatures ranging from 900 to 1,500 degrees Fahrenheit. Metals

such as titanium and special laboratory-designed ceramics play important roles in the design and construction of high-temperature components.

An ordinary electronic assembly, placed in an oven alongside a new high-temperature circuit, stops working immediately and melts into a puddle of metal and glass.

"Heaterless" tubes at the high temperatures do not need the power supply that is normally required to heat the filaments in vacuum tubes.

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## MARINE BIOLOGY

**Marine Borers Riddle Lead Telephone Cable**

➤ MARINE BORER MOLLUSKS are now known to attack lead as well as the wood, fibers, rocks and shells that they usually riddle with troublesome holes.

Damage to lead-sheathed submarine telephone cable in service since 1927 in the Ortega River, Jacksonville, Fla., was traced to mollusks of the *Pholadidae* family, by L. R. Snoke of Bell Telephone Laboratories and A. P. Richards of William F. Clapp Laboratories, Duxbury, Mass., who report their work in *Science* (Sept. 7).

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