

AERONAUTICS

Portable Control Tower For Air Force Operations

➤ A CAPSULE control tower and communications center drawn by jeeps was demonstrated at Andrews Air Force Base, Washington, D. C.

Dubbed "Project Two-Wheels," the mobile air center is mounted on seven family-style trailers, each with a job to do in setting up rapid aircraft control and navigational assistance.

The separate two-wheeled construction of the components allows the system to operate over rough roads and rugged terrain and to be set up alongside an airstrip or open field in a matter of minutes. When necessary, the equipment can be partially disassembled and loaded aboard aircraft for rapid transport to distant points.

The system includes the various functions necessary to complete air traffic control: radio sets on all frequencies, homing beacons and direction finders, as well as a two-way radio-teletype system and facsimile receiver for relaying weather information. Each trailer contains its own air conditioner and a five-kilowatt diesel power generator.

Any one of the units is designed to operate either by itself or as part of an integrated system, currently undergoing further refinement by the General Engineering Laboratory of the Air Force's Research and Development Command.

Science News Letter, June 7, 1958

ELECTRONICS

Electronic Machine Plays Chess

➤ A CHESS-PLAYING electronic computer that will play better than a fairly good player and another machine that can solve problems in geometry as well as a high school sophomore have been described.

The two computers exist only as instructions, or "programs," for other computers. They could be built as separate, special purpose devices, but scientists see no need to do this since the results are the same using the especially designed programs.

For both the computers, only the rules set up by their designers can now be followed, but both will be expanded later so the machines can learn from experience. The two units were described at a meeting on scientific communications held at the International Business Machines Corporation plant in San Jose, Calif. (See p. 355.)

The chess player was designed by Dr. Allen Newell, psychologist, and Dr. H. A. Simon, social scientist, both of Carnegie Institute of Technology, Pittsburgh. It is expected to play better than Dr. Newell but not as well as Dr. Simon, who is rated quite good. This is the third chess-playing machine to be put on a set of instructions in this country, and by far the best player. The Russians also have a chess player that is believed to be on about the same level but not much is known about it.

The chess player acts like a panel of "experts." It is essentially a collection of "rules of thumb" designed to accomplish certain

goals, such as protecting the safety of the chess king, controlling the board's center, or maintaining a balance of pieces.

Each "expert" can propose a move and each can reject a move proposed by another expert. Sometimes moves may be analyzed as many as ten moves ahead. The move that is finally chosen, however, is not necessarily the best possible—it is merely the first move that all "experts" can agree is acceptable.

The chess playing machine usually takes about ten hours before an agreement is reached and the move made. That is too much time for tournament play.

The geometrical theorem machine was described by Dr. Nat Rochester of IBM's research staff. It consists of three parts.

One unit constructs diagrams and looks for the obvious relationships, such as how many triangles it contains, and which angles and lines are equal. In about five seconds, this unit can analyze a diagram from a high school textbook, which is considerably faster than a high school student.

Another section, the syntax part of the machine, then looks up the rules that might be useful in solving the problem. The third part, a supervisory unit, tries these rules one after another until the problem is solved.

As soon as the geometry machine has worked its way through high school geometry, Dr. Rochester intends to change the rules from classic, Euclidean geometry, to non-Euclidean geometry. Then he will ask the machine to change its method of solving problems accordingly. This will be a step in the direction of a true learning machine.

Even with the fantastic speeds of modern computers, no machine can try all the possible moves in a chess game or all possible ways of solving a theorem, or problem, in geometry. No machine has yet beaten a very good chess player or proved a mathematical theorem not previously proved, but designers expect machines will do so in the near future.

Science News Letter, June 7, 1958

TECHNOLOGY

Central School Intercom Lowers Education Costs

➤ A CLASSROOM communications concept that is expected to lower education costs to the taxpayer was revealed in an educational exhibit at the Sheraton-Blackstone Hotel in Chicago.

Named the DuKane Multi-purpose Communication and Signaling System, MCS for short, the device incorporates six school communications installations operated from a central control desk:

1. Fire or emergency alarm system; 2. program clock signals; 3. central sound system, two-way; 4. automatic telephone service; 5. classroom TV distribution, "off-the-air" or school studio, and 6. school-to-home system for bedridden students.

Schools now often employ as many as three electronic systems, each separately installed. Uneconomical overlaps or functional gaps occur. Where an additional service is required, a separate installation must be made.

Science News Letter, June 7, 1958

IN SCIEN

EDUCATION

Today Bright Child Often From Average Home

➤ SCHOOL CHILDREN are getting brighter and brighter, and more and more gifted children are coming from average homes.

This was found by Dr. Elizabeth M. Drews of Michigan State University in a study of gifted youngsters in the Lansing public schools. In the 1920's, she said, a majority of very bright children were the sons or daughters of professional and high level managerial parents. Today, more and more are coming from the ranks of skilled, semi-skilled and white collar workers.

Schools are better today, Dr. Drews explained, and children are staying in them longer. Newspapers, television, radio, movies, magazines and books also give the children more stimulation in the home. More classical recordings, good art prints and better magazines are being purchased today.

Science News Letter, June 7, 1958

MEDICINE

Snakes Get Radioactive Iodine to Study Venom

➤ COTTONMOUTH moccasians are receiving injections of radioactive iodine in an attempt to discover more about the little-known nature of snake venom.

Iodine, which characteristically travels to the thyroid, also goes to the snake's poison gland. Very little information is available about the function of the poison gland, especially its link with the thyroid gland.

The unknown facts about poisonous venom are how long it takes for the venom to distribute itself through the body; where it goes; and what it does when it gets there.

Dr. Joseph F. Gennaro Jr., assistant professor of anatomy at the University of Florida's College of Medicine, is attempting to find answers to these questions by analyzing the radioactive snake venom milked from the snake after the iodine injection.

Studies so far have shown that the poison gland acts much like a thyroid in that it takes up radioiodine and reacts to thyroid stimulators and inhibitors, Dr. Gennaro said.

Further work is continuing on fractionating the venom into its components, all of which seem to play some part in killing. If the toxic portion is also labeled with radioactive iodine, such labeled components can be injected into test animals to determine the site of its killing action.

Dr. Gennaro has been assisted by Howard Ramsey, a medical student at the University.

Science News Letter, June 7, 1958

CE FIELDS

ASTRONAUTICS

High Satellites Visible Well Into Full Night

► SATELLITES circling the earth at very high altitudes can be seen well into the full night as well as at twilight.

Moonwatch observers should be relieved every 30 minutes, if possible.

These are two conclusions of separate studies on the visibility of satellites reported in *Science* (May 23) by Naval Research Laboratory scientists.

They used a device that simulates the passage of a satellite in both studies. Drs. I. S. Gullidge, M. J. Koomen, D. M. Packer and R. Tousey found that a 20-inch satellite orbiting at 800 miles will be sunlit until the sun is 34 degrees below the horizon.

Thus it can be seen moving against a sky filled with stars well into the full night, especially if it passes somewhat away from the zenith in the direction of the set sun.

Drs. W. D. Garvey, Irene S. Gullidge and Jean B. Henson studied the effect of length of observing time on the chances of detecting a faint satellite.

At a typical Moonwatch station set up to detect earth satellites, each observer looks through a low-power telescope at a part of the sky on a north-south line. He may be required to watch his assigned area for two hours or more.

The latter three scientists found that sometime between 15 and 30 minutes after the start of a watch, there is a decrease in a person's ability to spot a faint satellite, probably associated with decreasing vigilance.

Nevertheless, if there is no one to relieve a Moonwatch observer, "it is worthwhile for an observer to watch continuously for one to two hours," they conclude. This is because the satellite will often be bright enough to be seen in spite of the fact it must be brighter to be spotted late in an observing session than during the first half hour of it.

Science News Letter, June 7, 1958

MEDICINE

Electronic Heart May Replace Defective Organ

► ELECTRONIC hearts, kidneys, lungs, limbs and other organs of the human body may some day be as common as false teeth and hearing aids, Brig. Gen. David Sarnoff has predicted.

In addition, the day may come when electronic devices will help the blind to "see," control movements of the artificial limbs, aid scientists in their quest for a cancer cure, and bring the latest medical advice to any part of the world by television.

The probability that a man-made device

would ever take over the functions of a bodily organ would have seemed wildly fantastic before the electronic age, Gen. Sarnoff told the World Congress of Gastroenterology meeting in Washington, D. C.

But to a limited extent this goal has already been reached, bringing within the bounds of feasible surgery some operations formerly considered imprudent, if not impossible.

Electronic substitutes may be the ordinary replacement for defective organs in future years. A man may walk around in apparent good health with several of his organs replaced by the refined electronic devices.

Devices that in some measure "see" for the blind are in the experimental stages now. Work has been done to perfect the electronic detection of obstacles in the path of the blind or sudden changes in the ground or pavement levels. Progress is being made in translating ordinary type into audible signals, thus enabling the blind to "read" conventional printed matter.

Gen. Sarnoff is chairman of the Board of the Radio Corporation of America.

Science News Letter, June 7, 1958

MYCOLOGY

Valley Fever Fungus Resists Long, Hot Summer

► THE LONG, hot summer apparently cannot completely destroy the soil fungus that causes valley fever or coccidioidomycosis in humans. It has been found to exist throughout the hottest months in isolated small pockets six to eight inches deep in the earth.

This has been indicated in studies of desert field samples by Drs. Orda A. Plunkett and F. E. Swatek, mycologists at the University of California at Los Angeles.

Some time ago an anthropology class from UCLA excavated an old Indian camp site in the desert country near Inyokern, Calif. Two weeks later four members of the class and a fifth student, who had cleaned relics collected at the site, developed primary coccidioidomycosis which is a fungal lung infection. The students were promptly treated and the infection quickly cleared up.

Drs. Plunkett and Swatek studied soil samples taken from the site for a period of a year. It was found that during the hot desert months of August and November live spores of the soil fungus disappeared from the surface but existed six to eight inches in the soil, where it was somewhat cooler.

There was no evidence of the organism in the area outside of a small pocket six by ten feet, although the fungus is known to be airborne and high winds are frequent in the area.

Repeated sampling of soils from the immediate vicinity have never produced a positive sample.

The investigators said that apparently some unknown factor in the environment favors the growth of this fungus in certain definite habitats.

Science News Letter, June 7, 1958

MEDICINE

Injection Into Brain Aids In Parkinson's Disease

► CHEMOPALLIDECTOMY, injection of chemicals into the brain, is bringing help and improvement to sufferers of Parkinson's disease, or shaking palsy.

A follow-up study of 106 patients who had undergone the neurosurgery from six to 28 months before showed that they were, for the most part, in a better position than those who had not had the operation.

Of the group operated on, 89% reported that tremor and rigidity on the side affected by the operation showed improvement. Less than five percent noted any worsening of symptoms, Drs. Manuel Riklan, chief of the psychological and vocational services, St. Barnabas Hospital, New York, and Leonard Diller, coordinator of training and research in psychology, New York University Institute of Physical Medicine and Rehabilitation, report in the *Journal of the American Medical Association* (May 3).

The group operated upon became less dependent on assistance in daily self-care activities. Some were able to take up or resume useful occupations which contributed to a feeling of motivation and self-respect.

The surgery itself consists of injecting alcohol or a similar substance into either the globus pallidus or the ventrolateral nucleus of the thalamus, located in the lower middle section of the brain. This causes a chemical lesion, or wound, which relieves both tremor and rigidity.

The operation was devised in 1953 by Dr. Irving S. Cooper of New York University-Bellevue Medical Center.

Science News Letter, June 7, 1958

TECHNOLOGY

USDA Develops Durable Finish for Wood Houses

► A NATURAL finish for wood house siding, described as "the most durable" yet, has been developed by the U. S. Department of Agriculture's Forest Products Laboratory.

Scientists at the Laboratory, located in Madison, Wis., have been studying natural finishes for ten years and have come up with a "modified stain" that lasts four years. Most finishes now being marketed last only a year. It is said to be particularly good for western redcedar, redwood or Philippine mahogany sidings.

Although more tests are planned before the laboratory scientists give the finish an unqualified recommendation, many requests for the formula have been made and the information is available. The stain contains boiled linseed oil, turpentine, colorin-oil, paraffin wax, penta-chlorophenol and zinc stearate.

Its main drawbacks are that it dries slowly, taking one full day of good drying weather, and that, because it contains wax, it is hard to paint over the finish.

Science News Letter, June 7, 1958