

apy," he warned. For success in treatment, the patient "at least must have a basic dissatisfaction with herself."

• Science News Letter, 79:30 January 14, 1961

## Isolated Bluebirds Silent

► **YOUNG BLUEBIRDS** reared in isolation from adult songsters will never be able to sing, James M. Hartshorne, ornithologist from Cornell University, Ithaca, N. Y., has reported.

"Before it is a little more than a year old, a young bluebird must hear the song of an experienced adult or it will never be able to sing the typical song of its species," he told the American Association for the Advancement of Science meeting in New York.

Birds kept in isolation from the egg and nestling stage were able to sound the normal bluebird call notes of alarm, distress, aggressiveness and special location sounds, but their songs never developed beyond soft random warblings known as subsong.

Birds reared in isolation from fledglings (juveniles out of the nest up to two months of age) were able to utter the common call notes and the typical or primary song as well. This indicates a young bluebird can produce its full vocal repertoire if it has contact with experienced birds of its own species during the first two months of its life," Mr. Hartshorne said.

If the isolated birds were exposed to adult vocalizations at any time prior to 15 months of age, they could produce their species typical song. In fact, the young birds, when first hearing their species song, became wild with excitement and soon tried to repeat it. After 15 months of isolation, however, no matter how much the birds were exposed to the song, they were incapable of producing it.

In their quiet world of isolation, the bluebirds raised a family of young. Mr. Hartshorne said, however, that it was unlikely such birds could meet with success in the wild, because lack of song would be too great a handicap.

• Science News Letter, 79:31 January 14, 1961

### INVENTION

## Jet Pilot Training Aid Simulates Compass

► **A NAVIGATIONAL AID** that trains jet-age pilots without their leaving the ground can even accurately simulate the errors occurring in instruments under actual flight conditions.

Edward G. Schwarm of Binghamton, N. Y., has invented a device simulating the operation of a magnetic compass that gives the direction an airplane is traveling. The invention actually gives the "accurate" compass error that always results when a plane changes direction or its speed.

The proper correction of compass error, caused by the limitations of the compass systems, is an important phase of the precise navigation required in present-day jet travel, according to the inventor. Mr. Schwarm's device was awarded patent No. 2,965,976, which he assigned to General Precision, Inc.

A vehicle that can travel over rough land, swamps and lakes has been granted a patent by the U. S. Patent Office. The vehicle is essentially an engine mounted on a platform balanced on four oversized, air-filled rollers. It can maintain an essentially horizontal position even when driven on the side of a hill.

In addition to the driving mechanism for moving the rollers, an additional shaft is provided in the differential for attaching a propeller to navigate over bodies of water.

The vehicle is reported to be very compact so that it may be shipped with ease and speed. Vernon E. Gleasman of Cleveland Heights, Ohio, won patent No. 2,966,223 for this invention, which he assigned to The White Motor Company of Cleveland.

Persons with a broken leg can now move around more easily while the bone is mending, thanks to Arthur L. Purcell, Baldwin Park, Calif. Mr. Purcell has invented an adjustable walking iron, a device that is applied to a cast of the fractured leg to permit substantial use of the injured member during the healing period.

The walking iron, which received patent No. 2,966,154, consists of adjustable metal plates attached to an iron block. The metal plates can be easily secured to the cast by interlocking them with plaster of Paris.

A method and apparatus for electrical prospecting won patent No. 2,966,627 for James E. Hawkins of Broken Arrow, Okla., who assigned his rights to the Seismograph Service Corporation, Tulsa. Radio signals sent out from one or more transmitting points are received at other movable points, the relationship between the received signals indicating various geological formations through which the radio waves have passed.

• Science News Letter, 79:31 January 14, 1961

### ROCKETS AND MISSILES

## Centaur Booster Stage Has Added Fuel Capacity

### See Front Cover

► **THE BOOSTER STAGE** of the National Aeronautics and Space Agency's Centaur launch vehicle is being assembled at Convair Astronautics Division of General Dynamics Corporation, San Diego, Calif. The booster airframe, seen on the cover of this week's **SCIENCE NEWS LETTER** just beyond the missile in the foreground, is not tapered in the forward end. This gives the booster added fuel capacity.

• Science News Letter, 79:31 January 14, 1961

## Questions

**ASTRONOMY**—What information do scientists hope to get from photographs taken at an altitude of 80,000 feet? p. 24.

**EDUCATION**—How many percent of students questioned knew the name of the U. S. Secretary of Defense? p. 20.

**SOCIOLOGY**—How is I.Q. measured? p. 19.  
Photographs: Cover, Convair Division of General Dynamics Corporation; pp. 19 and 23, General Electric Company; p. 21, California Institute of Technology; p. 26, Walter C. Lowdermilk; p. 32, Minnesota Manufacturing and Mining Co.



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