Nature Note

Ant Lion

➤ IN EARLY SPRING, the three-eighths-inch long, homely ant lion, *Myrme leon,* emerges from his winter hiding place and selects a patch of sand in the garden or beside the sidewalk to set his trap for the summer hordes of ants.

He backs round and round in circles shoveling up the sand with his abdomen and throwing it aside with his head. When he has excavated a pit an inch or more across, he conceals himself in the sand at the bottom with just his long mandibles extended, and waits for an unwary ant to fall in his trap.

The ant slips and slides on the rolling sand. If it shows signs of escaping, the ant lion will stir the sand with his head. His mandibles have a groove on the underside, which, when clamped against the lower pair of jaws, the maxillae, makes a tube through which he sucks the ant's juices.

The ant lion will live for several years this way before he spins a cocoon lined with silk and coated with sand. He will emerge the following spring as an adult resembling a dragonfly, with four delicately veined wings.

Ant lions make fascinating pets in a sandy terrarium if supplied with ants and other small insects.

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AUTOMATION

Animated Movies Made by Computer

➤ ELECTRONIC COMPUTERS are making cartoons.

A 17-minute animated movie has been produced, using a cathode ray tube and a movie camera, both controlled automatically by an electronic computer.

The film, shown at the Spring Joint Computer Conference in Washington, D. C., illustrated the various techniques involved in making it.

Dr. Kenneth C. Knowlton of Bell Telephone Laboratories, Murray Hill, N.J., said that the film took two months of research and programming, four hours of computer time, and 2,000 hours of film processing, which resulted in a cost of about $600 per minute. This is comparable with conventionally drawn animated movies.

The picture is formed on a grid of spots on the face of the cathode ray tube just as on a television screen. The grid is 184 spots long by 252 spots high. Each spot can be any of several degrees of brightness, or completely dark.

The programmer tells the computer to "draw" a line from one point on the screen to another, and the tube lights up the proper spots on the screen. The screen is then photographed by a movie camera, also operated by the computer.

The computer's instructions include drawing straight and curved lines, printing letters, filling in shaded areas and varying brightness of individual spots.

In order to save time in giving instructions to the computer, a special language called BEFLIX (Bell Flicks) was developed. BEFLIX uses one term, or sub-routine, to refer to any irregular shape, which would otherwise require either a complicated explanation or individual instructions to each of 46,368 spots. This saves time when repeating the shape from frame to frame of the film.

One possible future development of this technique, Dr. Knowlton told SCIENCE SERVICE, is in teaching.

The computer might be told to draw certain objects. Then it would be told the laws controlling their behavior, and from these it would illustrate the objects' actions in a given situation.

For example, E. E. Zajac, also of Bell, had a computer show the orbital motion of a satellite around the earth, by telling it first the shapes of the objects, and then the forces of gravity, acceleration and momentum acting on them.

Dr. Knowlton said that the use of color might be possible, though no research is being done in that area.

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