

the West are doing it now. The difficulty with pesticides is that birds that prey on the carcasses of the poisoned starlings get pesticides in their bodies. Clearly something better is needed to get rid of starlings.

C. Val Grant of Utah State University has come up with a technique that may do the trick. It consists of training starlings to avoid feed that is mildly poisoned, and to have those starlings teach other starlings to do the same thing. Mildly poisoned food would then be spread in areas where starlings were unwanted to induce them to stay away. Mild poisoning would be less dangerous to humans and other animals than poisoning intended to kill. The Logan, Utah, behavioral ecologist described his research at the annual meeting of the American Institute of Biological Sciences held this week in Amherst, Mass.

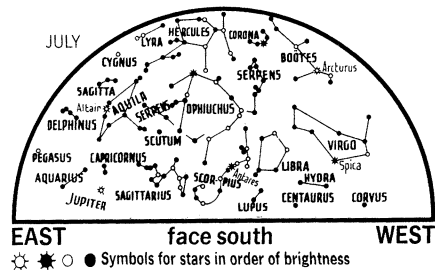
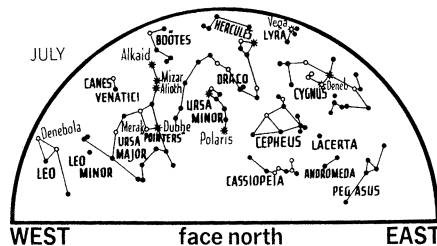
Grant put enough of a carbonate pesticide, Methiocarb, in feed pellets to make starlings become sick and vomit. He then did an experiment with three groups of starlings. A control group received a normal diet. Other birds got a regular diet every other day, and a mildly poisoned diet in between. Still other starlings received a mildly poisoned diet for seven successive days.

Grant found that the eating habits of the control birds stayed the same. The birds getting intermittent diets of poison slacked off in eating when poisoned feed was given to them, but they returned to eating when normal diets were made available to them the next day. The birds that received a continual diet of poison, however, stopped eating after the third day. Even when normal food was made available to them for a month following the poisoning test period, their eating was reduced considerably.

Convinced that he had induced avoidance behavior in the starlings, Grant put them in an outdoor aviary that was like an open field. The birds continued to avoid poisoned pellets. Most fascinating, Grant says, was the discovery that naive starlings put in the aviary followed the eating habits of the trained starlings. They would not eat the poisoned pellets.

Grant now will try to see whether starlings can discriminate between poisoned pellets and nonpoisoned pellets. He hopes not. If they cannot discriminate, then poisoned pellets put near a feedlot should deceive the starlings and keep them away from the lot.

The training technique might also be used to chase starlings out of cities, Grant hopes. Although starlings prefer insects, they adapt amazingly well to other foods. So whatever they eat in cities might be mildly poisoned without hurting people or other animals. □



Bright planets on evening display

by James Stokley

July will bring one of the best evening sky displays of the bright planets seen in several months. Venus, conspicuously low in the west as darkness falls, sets about an hour and a half after sunset. Jupiter is in the south-east in the constellation Capricornus. Opposite the sun on July 30, it is visible all night. About midnight Mars appears in the east in Pisces. During the last half of the month Saturn will be visible low in the east just before dawn.

Jupiter is the largest planet in the solar system—88,700 miles in diameter—nearly 11 times that of earth. With a volume 1,318 times as much as earth, it contains only 318 times as much matter. This is, however, more than that of all the other planets combined. Its density is thus quite low, about one and a third times that of water or about a quarter as dense as the earth.

Viewed through a telescope its disk is crossed by light and dark bands in a variety of colors: orange, red, brown and sometimes even green. These are the tops of clouds surrounding the planet. They seem to consist largely of frozen ammonia but the atmosphere seems also to contain hydrogen and methane (marsh gas).

In recent years astronomers have supposed that Jupiter's atmosphere extended down to a depth of about 8,000 miles. Then came a layer of ice and slush some 17,000 miles deep with a central core of rock and metal over 38,000 miles in diameter.

According to this theory Jupiter consists of about 10 percent hydrogen, a proportion which seems too low to some astronomers. Jupiter and the other major planets, they suppose, were formed of material like that of the sun. The sun contains more than 90 percent hydrogen.

An English astronomer, William H. Ramsey, has suggested that Jupiter has no rocky core but consists entirely of a mixture of gases. Deep inside the planet, however, the weight of the outer layers would be so great that the gases would be compressed to enormous densities. At very high pressure hydrogen changes to a metallic form, which conducts electricity and

resembles sodium and potassium. Pressure deep inside Jupiter is many times that needed to produce this change.

The new theory, which many astronomers now favor, is that Jupiter consists mainly of hydrogen, along with some helium and other gases. At a depth of about 9,000 miles the hydrogen is in the metallic phase but perhaps liquid. There may be a solid core of metallic hydrogen at the center.

Some of the information gained by Pioneers 10 and 11, now on their way to Jupiter, may help planetologists to solve many questions concerning that planet.

Six first-magnitude stars are also visible: Vega in Lyra; Deneb in Cygnus; Altair in Aquila; Spica in Virgo; Arcturus in Boötes and Antares in Scorpius.

Scorpius is at its best evening position of the year. It is now as high in the southern sky as we ever see it from our northern latitude. In countries south of the equator, where it appears overhead, you can see what a magnificent constellation it really is.

A good way to locate Arcturus is to look in the northwest for the familiar Big Dipper, in Ursa Major. Follow the curve of its handle to the south and you come to Arcturus. To the right of the Dipper is Ursa Minor with Polaris, the polestar.

The two maps show the sky as it looks about 11 p.m. (local daylight saving time) on July 1, 10 p.m. on the 15th and 9 p.m. on the 31st. □

CELESTIAL TIMETABLE

July	EDT	
1	11:00 pm	Moon passes south of Venus
7	4:26 am	Moon in first quarter
12	6:00 pm	Moon farthest, distance 252,200 miles
15	7:56 am	Full moon
16	6:00 pm	Moon passes north of Jupiter
20	2:00 am	Mercury between earth and sun
22	11:00 am	Moon passes north of Mars
	11:58 pm	Moon in last quarter
28	3:00 am	Moon nearest, distance 224,100 miles
29	2:59 pm	New moon
31	midnight	Moon passes south of Venus