ASTRONOMY

Winter Constellations Disappearing

Great Dipper, Familiar Constellation of Many Names, Seen to Best Advantage in April; Planets Scarce

By JAMES STOKLEY

IN THE evening skies of April the most conspicuous of all star groups appears at its best. This is the Great Dipper, which is now high overhead to the north in the evening at the times for which these maps are drawn: ten o'clock on April 1, nine on the 15th and eight on the 30th. Almost everyone knows it, though in other countries it has other names. The English, for instance, call it either "the plough," or "Charles' wain." In Germany it is called by a similar name, "Karlswagen," while in some parts of France it is called casserole, or saucepan.

This group, however, is really part of Ursa Major, the great bear, and the handle of the dipper is supposed to form the bear's tail—an appendage such as no member of the genus now extant is able to boast! It is particularly surprising to find that in widely scattered parts of the earth it was called by a similar name. For instance, the Finns called it a bear, and so did the American Indians, but at least they knew their bears a little better. To the Iroquois, the three stars forming the handle of the dipper were not the tail, but three hunters pursuing the bear. The first, they explained, carried a club to slay the beast, the second a pot in which to cook his meat (and a faint star close to this, called Alcor, was supposed to represent the pot) while the third had a bundle of twigs to make the fire needed for the culinary process.

Big and Little

Many of the celestial animals appear in duplicate, and the bear is one of these. The little bear, Ursa Minor, appears below the great one. The pointers, the two stars in the bowl of the big dipper, show the direction of Polaris, the pole star. This is the end of the handle of the little dipper, and the tip of the little bear's tail. It is called the pole star because it is close to the North Pole of the heavens, the point of the sky directly over the North Pole of the earth, and around which all the stars apparently turn. Its proximity to this point keeps it always in approximately the same position, because it moves in a very small circle.

As high in the south as Ursa Major is to the north one can now see the lion, Leo. In this is a group called the sickle, of which Regulus is below, at the end of the handle. To the east is Bootes, in which shines the brilliant Arcturus. A good way to find this star is to follow the curve of the handle of the great dipper to the south; if you go still farther you come to Spica, in Virgo, the virgin, to the right of which is a quadrilateral of stars forming Corvus, the crow. Below Bootes is the figure of Hercules, and below this, close to the horizon, Vega can be glimpsed, part of Lyra, the lyre.

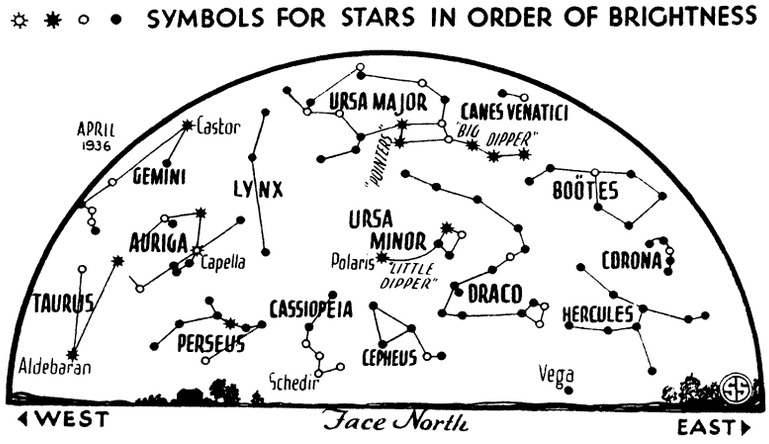
Winter Stars Leaving

In the western sky appear now for the last time this season those constellations that made the winter evening skies so glorious. Orion is almost directly west, but he is only partly visible; for his feet are below the horizon at the time of the maps. Sirius, the dog star, part of Canis Major, the greater of his two dogs, is in the southwest, and above it is Procyon, in Canis Minor, the lesser dog. The head of Taurus, the bull, with ruddy Aldebaran, is low in the northwest, and next to it is Auriga, the charioteer, with the first magnitude star Capella. Directly above Orion are the twins, Gemini, with the stars Castor and Pollux, the latter, the brighter, to the south. Near the horizon, to the north is Cassiopeia, like a letter W on end.

No Planets

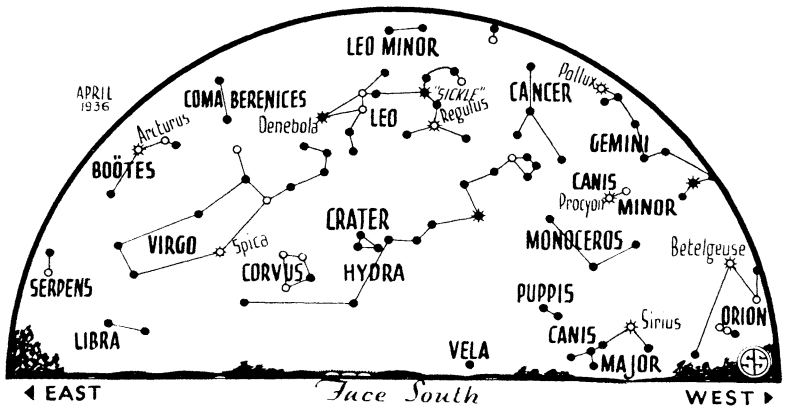
No planets are well placed this month for evening observation. Mars is theoretically an evening star, since it sets after the sun, but it is so low by the time it gets dark, and so faint, that it will be difficult to see, even early in the evening. Mercury is too near the sun all month to be seen. Venus is a morning star, in the constellations of Aquarius and Pisces, rising shortly before the sun. Saturn is also a morning star, but is very faint. At the beginning of the month Jupiter rises about midnight, in the constellation of Ophiuchus, and is really the only planet that can be seen very well at any time during the night.

Many of the constellations, practically all of the most familiar ones, date back to very early times, so far, in fact that no one can tell just where they did originate, though some authorities believe that they started in the same place, among the same group of peoples. There are many evidences of some ancient system among them, such as the duplication of some figures, as well as their arrangement. Just 88 figures are officially recognized today, and half of them are modern. Some of the newer ones are



AT ITS BEST

High over head the familiar Big Dipper, known to nearly everyone, appears to the best advantage during the month of April.



BIG AND LITTLE

Many of the celestial animals appear in twos—Major and Minor. Canis, the dog, and Leo, the lion are two of these

in parts of the sky containing no very bright stars.

Telescope Changed Maps

Since the ancients had nothing but their unaided vision with which to study the stars, these spaces were left blank, but after the telescope came into use, beginning in 1610, fainter stars were seen. Then, in the year 1685, a Polish astronomer named Hevelius published a book of star maps in which he introduced several new constellations. One of these was Canes Venatici, the hunting dogs, which is inside the curve of the handle of the great dipper. Another, Leo Minor, is above Leo, at the zenith for the times of the maps. The lynx was another; this is between Auriga and Ursa Major. The others were Sextans, the sextant; Lacerta, the lizard; Scutum, the shield, and Cerberus, which Hercules was holding. Only the last has not been retained to modern times.

Other constellations were added when astronomers began to visit the southern hemisphere and to observe stars that never rise for Europeans. Telescopium, the telescope; Fornax, the furnace; Octans, the octant; Pictor, the painter's easel, and Horologium, the clock, are some that date back to this period.

Thus our constellations have arisen from a number of sources. The modern astronomer, of course, pays no attention to the figures which they were supposed to represent, but regards them simply as areas, using the old names to designate them. Of course, the entire arrangement is a very unscientific one, and if it were being done over, a much more convenient system could doubtless be evolved. About a century ago there actually was an effort made to alter them. In his "Outlines of Astronomy," first published in 1849, Sir John Herschel, the famous son of an even more eminent father, expressed his opinion in no uncertain terms.

"Of course we do not here speak of those uncouth figures and outlines of men and monsters, which are usually scribbled over celestial globes and maps, and serve, in a rude and barbarous way, to enable us to talk of groups of stars, or districts in the heavens, by names which, though absurd or puerile in their origin, have obtained a currency from which it would be difficult to dislodge them," he wrote.

"This disregard is neither supercilious nor causeless. The constellations seem to have been almost purposely named and delineated to cause as much confusion and inconvenience as possible. Innumerable snakes twine through long and contorted areas of the heavens, where no memory can follow them: bears, lions and fishes, large and small, northern and southern, confuse all nomenclature. A better system of constellations might have been a material help as an artificial memory."

Old Names Permanent

But despite this opinion, which was and is entirely justified, the old names have been retained, and seem entirely permanent. A few years ago, however, a commission of the International Astronomical Union corrected part of the confusion. Before that, there had been no universal agreement as to the boundaries of the constellations. In 1930 the report of the commission was published. Eighty-eight were officially recognized, and their borders were made straight lines, running either east and west or north and south. There is thus no longer any ambiguity as to what constellation any particular star is in.

Phases of the Moon: full moon, April 6, 5:46 p. m. Eastern Standard Time; last quarter, April 14, 4:21 p. m., Eastern Standard Time; new moon, April 21, 7:32 a. m., Eastern Standard Time; first quarter, April 28, 6:16 a. m., Eastern Standard Time. Moon in apogee (farthest from Earth) April 6, distance —252,500 miles. Moon in perigee (nearest Earth) April 15, distance—222,400 miles.

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PHYSICS

Einstein Stresses Faith As the Basis of Science

By DR. W. E. DANFORTH, Bartol Research Foundation

WHEN grandfather is able to lay his hands on his reading glasses without organizing a general search of the house, when father remembers a wedding anniversary without a subtle hint or two from mother, and in numerous other instances of people behaving as they are supposed to, their associates show symptoms of surprise.

That we should likewise be surprised when the physical world behaves as it is supposed to is implied in an article by Dr. Einstein. (*Journal of the Franklin Institute*, March).

"The eternal mystery of the world is its comprehensibility," according to Dr. Einstein. The article in which he says this has been translated from the German by Dr. Jean Piccard, noted scientist and stratosphere balloonist.

Einstein was speaking, of course, not of everyday objects, but of the fact that laws of nature can be summarized by means of a few mathematical equations, and that these equations are always obeyed.

But the laws for which physicists write equations are also the laws which govern every day occurrences, the rising of the sun, the flow of water, and so forth. It is therefore but a short step from Einstein's statement to the idea that it is indeed wonderful that gasoline should burn tomorrow as it does today, that iron should continue to be attracted to a magnet.

All a matter of faith, and how lucky we are that the world is so dependable!

In the layman's view the seat of science is the laboratory. Mention that a scientist is seeking a hidden fundamental secret, and most of us will at once envision test tubes, microscopes, and huge vacuum tubes. But Dr. Einstein wishes to emphasize another phase of the mat-