

ASTRONOMY

May Skies Herald Approaching Summer

BY JAMES STOKLEY

NOT ONLY in its proverbial mild weather does the month of May bring a foretaste of approaching summer. The evening skies also herald its coming. Orion, Taurus with red Aldebaran, and the dog-star Sirius, so familiar in the winter sky, have now disappeared below the western horizon. In the east, Vega, part of Cygnus, and Scorpius, with the other famous red star, Antares, have arisen to take the place of the glories that have departed temporarily, and as the months go on, and summer begins, they will be conspicuous objects in the evening sky.

Altogether, in the evening sky in May, you can see nine first magnitude stars, which are now supplemented by two bright planets. High in the north is the familiar great dipper, in Ursa Major, the great bear. Though this group contains none of the brightest stars, its characteristic shape makes it a good starting point from which to find the main attractions of the month. Everyone knows how the two stars at the end of the bowl of the dipper are called "the pointers." If you imagine a line drawn from them to the north, you can locate the north star, Polaris, which is in the constellation of Ursa Minor, the lesser bear, and also marks the end of the handle of the little dipper.

But continue the line through the pointers in the opposite direction. About a quarter again as far from them as Polaris is the constellation of Leo, the lion. At the western end of the group is the sickle, almost as familiar as the dipper. As it hangs in the sky, its blade pointing westward and the handle to the south, one can easily see the resemblance to that useful agricultural implement. The first magnitude star, Regulus, is at the end of the handle. This is the "royal star," so called because it was supposed to rule the affairs of heaven, according to the ancient astrologers, whose superstitions are now thoroughly discredited. A little below and to the right of Regulus is the planet Mars, a little brighter, and conspicuous by reason of its steady red light. Below Mars, and farther to the right, is the other May planet, Jupiter, still brighter, and exceeding in brilliance any of the stars now visible. A short distance

above Jupiter, and also to the right, is Pollux, the brighter of the twins, Gemini. Castor, his fainter, second magnitude, brother, is close beside. Low in the west shines Procyon, in Canis Minor, the lesser dog, and low in the northwest Capella marks Auriga, the charioteer.

Jupiter and Mars, like all the other bright planets, the moon and the sun, always remain close to an imaginary line in the sky called the ecliptic. This line marks the place where the plane of the earth's orbit would cut the sky. Regulus, though it is a star, and does not move around like the planets, happens to be almost on the ecliptic, so from these three points one can trace its course. Immediately to the east of Leo, among the constellations of the ecliptic, is Virgo, the virgin, in which the most brilliant star is Spica. This star is also close to the ecliptic. Its name signifies the ear of wheat that the old star maps represented the virgin as carrying.

"Rival of Mars"

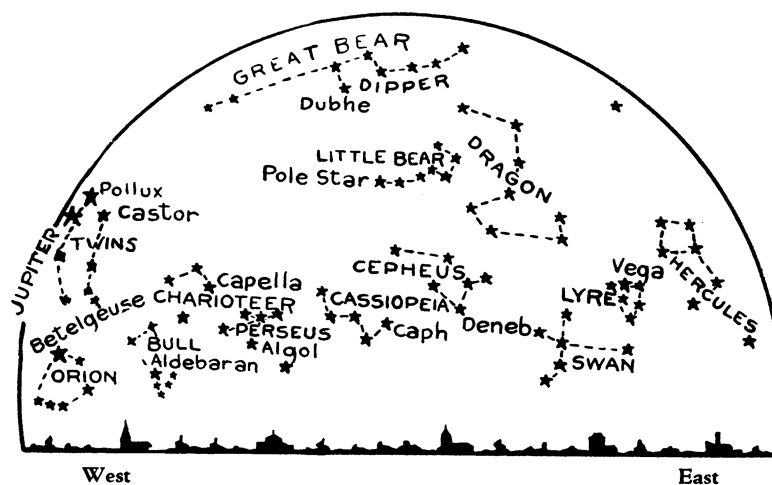
The next constellation in the ecliptic is Libra, the scales, but it contains no very bright stars, so we continue to Scorpius, the scorpion, now just appearing in the evening above the southeastern horizon. Its most brilliant star, the red Antares, whose name means "the rival of Mars," is seen low in the sky. Just now, when Mars and Antares are both in the sky, it is easy to com-

pare them, and to see how the similarity of color suggested the name.

Adjoining Virgo to the north is the group of Bootes, the herdsman. His most brilliant star, Arcturus, is almost overhead. This constellation is just at the end of the handle of the great dipper. The handle marks the enormous tail of the bear, Ursa Major, a group with which Bootes has been closely associated. In fact, the name Arcturus is derived from two Greek words which mean "the bear's tail," and as the name was at one time applied to the entire constellation of Bootes, the connection is obvious.

Low in the northeastern sky can now be seen the bright star Vega, in Lyra, the lyre. Just below it is the constellation of Cygnus, the swan. During May evenings it is only partly above the horizon, but later in the night it rises higher. Then can be seen its familiar shape, in the form of a cross, which has earned for it the other name of "northern cross." Deneb, the last of the first magnitude stars in the May evening sky, is at the northern end of the group.

Quite different from the conspicuous constellations mentioned is one now at the zenith in the evening, about halfway between the bowl of the great dipper and Arcturus. Except under very good conditions, only two stars can be seen, the brighter one being Cor Caroli, the heart of Charles. This name was given by (*Turn to page 286*)



HIGH IN THE NORTH IS THE GREAT DIPPER

Its characteristic shape makes it a good starting point from which to find the main attractions of the month.

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May Skies Herald Summer

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Edmund Halley, whose own name is perpetuated in the best known of all comets. He applied this designation in 1725, in honor of Charles II. At the time Halley was Astronomer Royal of England, a position which evidently gave him sufficient authority to name a star.

When Halley thus named this star, the constellation it marked was less than half a century old. Most of the constellation names date from remote antiquity, but this little group, called Canes Venatici, the hunting dogs, was not so designated until the year 1687. The sponsor of the name was Johannes Hevelius, who had a great observatory at Dantzig. Before his time the star maps, that represented the imaginary constellation figures, had several large gaps, especially around Ursa Major. Evidently Hevelius was a rather systematic person, so these gaps, containing faint stars belonging to no constellation, were a source of irritation to him. He proceeded to fill them in. In the year 1687 he published a set of beautifully engraved star maps, covering the entire sky. The title-page of this work, which is now extremely rare, is an allegorical picture representing Hevelius presenting his constellations to Urania, the muse of astronomy.

What is perhaps the most interesting feature of this little constellation cannot be seen with the naked eye. Almost on a line joining Cor Caroli with the star at the end of the handle of the dipper, named Benetnasch, and about three-quarters of the way is a famous

spiral nebula. Through a moderate sized telescope, under good conditions, it appears only as a faint patch of light. But through the very greatest instruments, or on long exposure photographs with big telescopes, its structure is seen. This was first observed nearly a century ago by the Earl of Rosse, an Irish nobleman who had a very famous observatory at Parsonstown, near Dublin. His great telescope was a reflector with a mirror six feet in diameter. Not until 1919, when the 100-inch reflector was completed at Mt. Wilson, in California, was this old-timer exceeded in size. Long since, however, it had become obsolete, and much smaller modern instruments surpass it in performance.

The Whirlpool Nebula

The Earl of Rosse, observing its spiral structure for the first time, appropriately named it "The Whirlpool Nebula." It looks like a great pinwheel. To the astronomer it is usually Messier 51, its number in Messier's catalog of such objects.

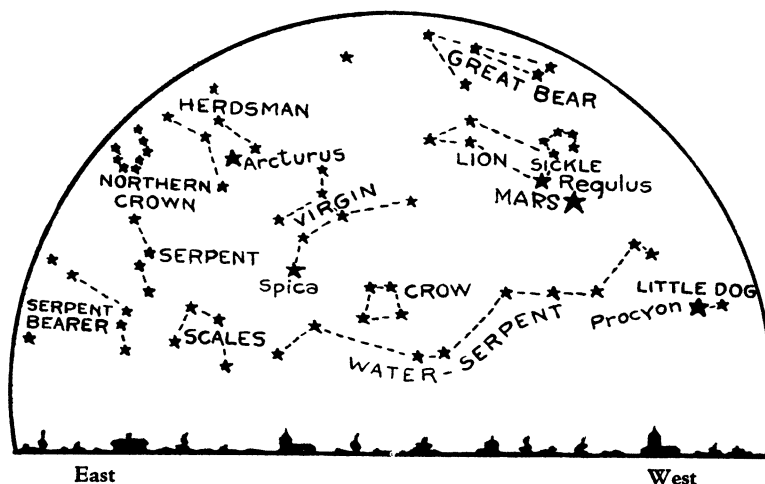
When the nobleman first observed this beautiful object, probably he had no idea that he was gazing at an external galaxy—a system of stars very much like that of which the sun, and all the stars we see, are part. Yet that is just what it is. A few years ago Dr. Edwin P. Hubble, a Mt. Wilson astronomer, measured the distance of two similar nebulae, and found them at distances of about a million light years—a million times the six trillion miles that a beam of light will traverse in a year. Probably Messier 51 is somewhat farther, perhaps two or three times as far.

This part of the sky, including the constellation of Coma Berenices, or Berenice's hair, between Canes Venatici and Virgo, is about the richest region of the sky in spiral nebulae, because it marks the pole of the Milky Way. That is, of all the parts of the sky that can be seen from the United States at any time, this part is farthest from the Milky Way. Most astronomical objects, like the ordinary stars, are most numerous in the Milky Way, but the spiral nebulae avoid it. The reason is that the Milky Way forms a flat, disc-shaped system, the Galaxy, of which our sun is a member, located somewhere near the center. The spiral nebulae are external galaxies. When we look at the Milky Way, we are looking through the greatest thickness of stars in our own system, and these, together with the dark material that seems to be associated with them, prevent us from seeing out beyond. But when we look towards the poles, there is not so much material in the way, and we get a nearly unobstructed view of what is outside.

Just as the stars are clustered together to form the galaxies, so are the galaxies themselves gathered into supergalaxies, a fact that has been clearly demonstrated by the distinguished director of the Harvard College Observatory, Dr. Harlow Shapley. The super-galaxy to which he has given the greatest attention is in this same region of the sky, partly in Coma and partly in Virgo, so it is referred to as the Coma-Virgo cluster. According to Dr. Shapley, it is several million light years in extent, and contains perhaps 500 galaxies. The diameters of the individual members range from one to two thousand to more than twenty thousand light years.

The exact significance of this system, and its relation to our own Galaxy, is still a matter of discussion. According to older figures, our Galaxy is far larger than any of the known spiral nebulae, so Dr. Shapley made the suggestion that we are living in a super-galaxy, perhaps more condensed than the Coma-Virgo cluster, but of the same general nature. During the past year, however, the work of Dr. R. J. Trumpler, of the Lick Observatory, has shown definitely that there is a large amount of light-absorbing stuff in the Milky Way, and that one effect would be to make apparent distances in the Milky Way seem too large. If this is the case, our Galaxy may not be much larger than the outside ones after all.

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SOUTHERN SKIES DURING MAY

To the southwest and near the planet Mars can be found Regulus, the star which, though it does not move around like the planets, happens to be almost on the ecliptic, the imaginary path of the planets.