THE HEAVENS IN JUNE.

BY HENRY NORRIS RUSSELL, PH.D.

Our map shows the sky as it appears in the early evening, just after dark. The brightest star in sight is Arcturus, which is due south, and very high up. About it lie the other stars of Boötes, the Herdsman, which can be easily picked out with the aid of the map. The star Epsilon (ε) is a fine double, which can be well seen with a three-inch telescope.

Below this is Virgo, with one bright star, Spica, which is nominally of the first magnitude, though much fainter than Arcturus. The five stars which lie above and to the right of Spica also belong to the constellation. Below them are the groups of the Cup and the Crow, which are both on the back of the great Sea Serpent (Hydra). Due west, and pretty well up, is the Lion (Leo). The star α in this constellation is of the first magnitude, and bears the name of Regulus. The neighboring star γ is a fine telescopic double.

The Great Bear fills the upper part of the northwestern sky. Below it are Gemini and Auriga, both setting. Inside the curve of the dipper handle are the Hunting Dogs, with which the Herdsman is supposed to be pursuing the Great Bear. They have only one prominent star between them, which is worth a telescopic glimpse, as it is double. South of them lies the constellation of Berenice's Hair, a tangle of faint stars.

Below Virgo, on the left, is Libra, the Scales, which boasts only two bright stars. The southern one of the two is a wide double, interesting in a field glass. Farther southeast is Scorpio, the finest of the twelve zodiacal constellations, though so far south that we never see it to the best advantage. Its principal star, Antares, is one of the reddest in the sky, and is a very interesting telescopic object, both on account of its color and because it has a faint companion, of a vivid green hue, which intensifies the red by contrast.

β Scorpii is also a fine telescopic double, while μ can be seen double by the naked eye, when the air is clear enough to give us a good look at it.

Due south, below Virgo, we may see parts of the southern constellations of the Centaur and the Wolf. The former has two very bright stars, but they cannot be seen at all from points north of New Orleans.

In the southeast is the intricate mass of Ophiuchus, the Serpent Bearer, and Serpens, the serpent which he carries. Higher up, and almost due east, is the semi-circle of the Northern Crown, below which is Hercules. This is a large constellation containing several interesting telescopic objects. The star α is a fine double, the brighter star being red, and its companion blue. The principal component is variable in brightness, and has a superb banded spectrum, which may be easily seen by placing a prism in front of the eyepiece of the telescope. δ Herculis is also double, but the most interesting object in the constellation is the great star cluster which lies between the stars η and ζ, nearer the former. This is faintly visible to the naked eye, and easily in a field glass, appearing as a hazy spot of light, near which lie two small stars. Moderate telescopic power splits up the spot into hundreds of faint stars, while great telescopes show many thousands of them.

Below Hercules in the east is Aquila, the Eagle, just rising, and farther north are Cygnus, the Swan, with the Lyre above it, marked by the great white star Vega. Farther to the left are the circumpolar constellations—Draco and Ursa Minor above the Pole, and Cepheus and Cassiopeia below it.

THE PLANETS.

Mercury is morning star until the 8th, when he passes back of the sun and becomes an evening star. He is visible only during the last ten days of the month, when he may be seen in the evening twilight, as he sets more than an hour later than the sun.

Venus is evening star in Gemini and Cancer, and is very conspicuous, remaining in sight till about 9:30 P.M. Mars is also in Gemini, nearer the sun than Venus, and is hardly observable, as he sets at 8 P. M.

Jupiter is in conjunction with the sun on the 10th, and is invisible throughout the month.

Saturn is morning star in Aquarius, and rises near midnight on the 15th, so that he is observable in the early morning.

Uranus alone of all the planets is well placed for observation this month. He comes to opposition on the 28th, and is then in Sagittarius in R. A. 18h. 28m. 30s. and declination 23 deg. 36 min. south. He is moving slowly southwestward, at the rate of 10s. in R. A. and 7 sec. in declination per day.

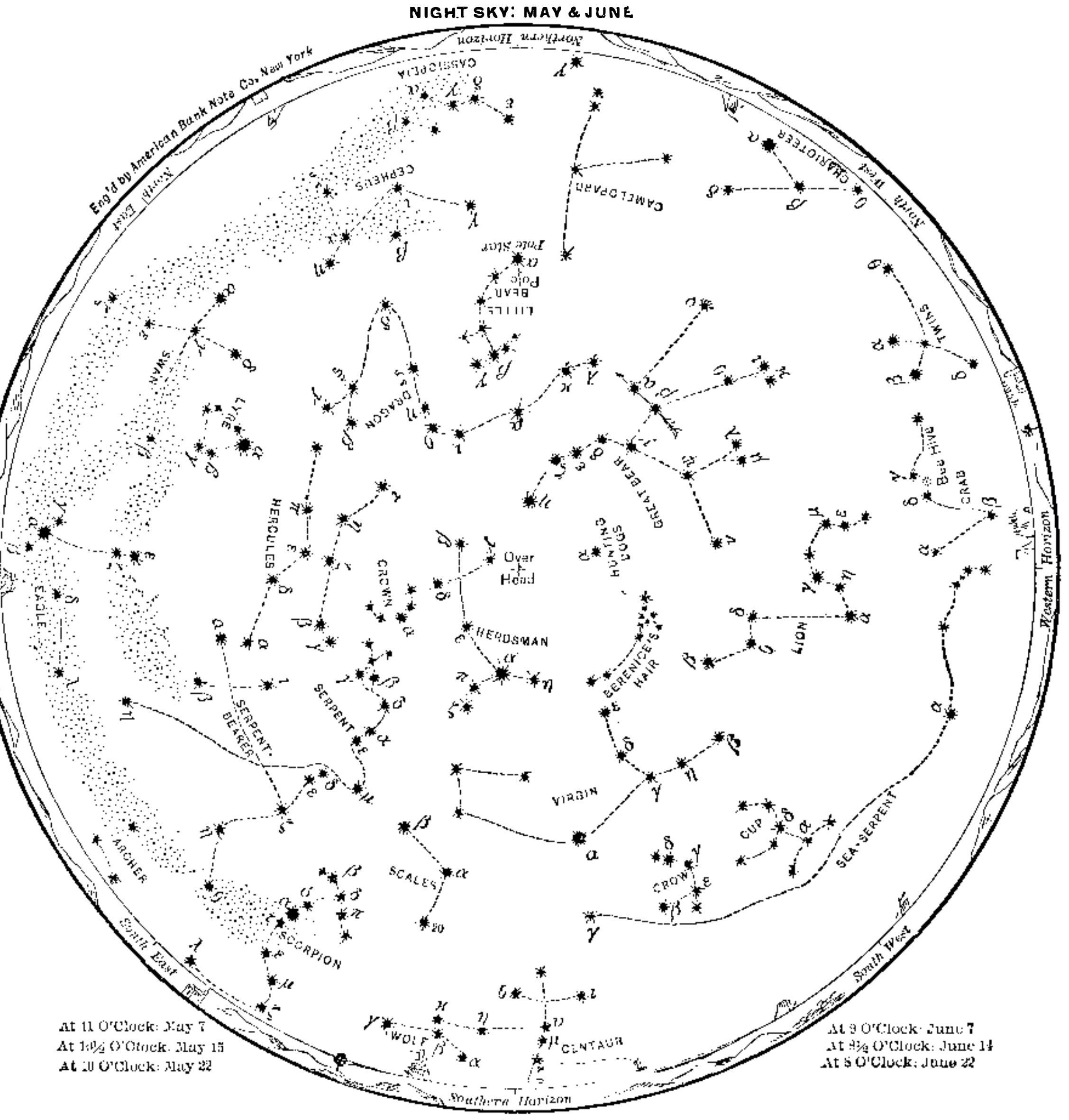
Neptune is in Gemini, too near the sun to be observed.

THE MOON.

Full moon occurs at 4 P. M. on June 6, last quarter at 2 P. M. on the 13th, new moon at 6 P. M. on the 21st, and first quarter at 9 A. M. on the 29th. The moon is nearest us on the 6th, and farthest away on the 18th. She is in conjunction with Uranus on the 8th, Saturn on the 13th, Jupiter on the 21st, Mars and Neptune on the 22d, Mercury on the 23d, and Venus on the 24th. None of these conjunctions is close. At 3 P. M. on the 22d the sun reaches his greatest northern declination, and enters the sign of Cancer, and in the old almanac phrase, "summer commences."

Princeton, May 17, 1906.

NIGHT SKY: MAY & JUNE



In the map, stars of the first magnitude are eight-pointed; second magnitude, six-pointed; third magnitude, five-pointed; fourth magnitude (a few), four pointed; fifth magnitude (very few), three-pointed, counting the points only as shown in the solid outline, without the intermediate lines signifying star rays.

A NEW COMPOUND.

Continuing his researches upon the iodo-mercurates of the alkaline earth metals, M. A. Duboin, of Paris, after forming compounds with calcium and strontium, now succeeds in preparing the iodo-mercurate of barium and observing its properties. It has the form of a saturated solution, and this solution was previously obtained by Rohrbach, who found it to be remarkable as one of the densest bodies known, having a density of 3.56. Duboin determined the composition of this body, which contains barium, 12 parts, mercury 23.40 parts and iodine 52.16 parts per 100. This corresponds to the formula BaI_2, $1.33HgI_2$, $7.76H_2O$. It is a mixture of two iodides which are soluble in 96 per cent alcohol. The saturated solution has a density of 2.76 at 23.5 deg. C. When this liquid is saturated with bioxide of mercury at 70 deg. C., upon cooling it deposits oxide of mercury and also small crystals having the formula BaI_2, $5HgI_2$, $8H_2O$. These crystals resemble the corresponding salts of calcium and strontium, but they are more easily decomposed and become red after a time, even in sealed tubes. M. Duboin obtained another definite hydrate by keeping a liquid containing barium 11.67, mercury 22.41, iodine 49.59 at a temperature of —9 deg. This liquid has the formula BaI_2 $1.30HgI_2$, $10.41H_2O$. The hydrate that he thus obtains appears in the form of an agglomeration of large four-sided prismatic crystals. The formula for this body is $2BaI_2$, $3HgI_2$, $16H_2O$. Its density at 0 deg. C. is about 4.0. The crystals melt when the temperature rises. Another salt is obtained by the evaporation of a solution containing barium 13.95, mercury 19.16, iodine 50.22, or HgI_2, $1.07BaI_2$, $9.71H_2O$. When this liquid is evaporated under a bell-jar in presence of sulphuric acid, it deposits prismatic crystals which are very deliquescent. Their density at 0 deg. C. is about 4.06 and they have the formula $3BaI_2$, $5HgI_2$, $21H_2O$. Corresponding to this salt we have the iodo-mercurates of magnesium and manganese.

A UNIQUE VACUUM APPARATUS.

In a paper lately presented to the Académie des Sciences, Messrs. Georges Claude and R. J. Lévy describe an apparatus which is designed to utilize the property of carbon remarked by Dewar for producing a vacuum. This property consists in the strong absorption of gases by carbon when at the temperature of liquid air. The vacuum is made in several stages. A partial vacuum is obtained with an air-pump in the desired vessel and in one or more vessels containing carbon. The pump is then disconnected and one of the vessels plunged in liquid air. We thus form a new vacuum upon the partial vacuum already obtained in the carbon vessels and in the vessel in which we need the vacuum. The carbon vessel is then cut off and a second vessel is plunged in liquid air. It makes a still better vacuum on the main chamber and the remaining carbon chambers. We then cut it off and replace it by a third chamber, and so on. In practice, two carbon chambers are enough to obtain the highest vacua. The apparatus must be of simple design and arranged so that we may insert or cut out the successive chambers with the necessary rapidity and tightness which are indispensable for the very high degrees of vacuum obtained. The present apparatus is so combined that the operation of inserting or cutting out the chambers from the main vacuum chamber is carried out by mercury columns worked by piston plungers or by atmospheric pressure. The tops of the mercury columns are cooled by liquid air so as to eliminate the tension of the mercury vapor, which is a hindrance for the operations and for the perfection of the vacuum. As an example of the rapidity of absorption of the gases by the carbon we may mention that the experimenters, starting from an initial pressure of 2 millimeters of mercury, were able to arrive in 15 minutes to the extinction point for fine Crookes tubes of 80 cubic inches capacity which were exhausted at the same time.

LECTURE-ROOM BOOMERANG.

L. Pfaundler's paper on "Boomerang for the Lecture-room," which is printed in Akad. Wiss., gives the following information:

Small boomerangs of various shapes, and 6 to 10 centimeters long, are cut from aluminium foil 0.5 millimeter thick, and hammered convex on one side. These are placed on a small table so that the concave edge is to the front, and one end projects over the side of the table almost on a level with the top of a flat, vertical steel spring used for propelling the boomerang by hitting the projecting end. The boomerang shoots forward and upward for a distance of 5 to 6 meters, and then returns almost to the starting-point. The boomerang is gradually deformed by the repeated percussion of the spring.