

THE HEAVENS IN OCTOBER, 1902.

BY HENRY NORRIS RUSSELL, PH.D.

The most important event of the month for the American amateur astronomer is the total eclipse of the moon which takes place on the night of the 16th and 17th. Though lunar eclipses are not of rare occurrence, it is almost three years since we have seen one of any size, and four years since we have been able to observe one that was total. Since this is so, we may well spend some time in discussing the causes and phenomena of such an event, even though they may be familiar to many of our readers.

Everyone knows that eclipses of the moon are caused by her passage through the earth's shadow. This shadow extends from the earth in exactly the opposite direction to the sun, and, since the sun is larger than the earth, it tapers off to a point which is about four times as far away as the moon's orbit. For an observer situated anywhere within it, the earth hides the sun completely.

If the moon's orbit were in the plane of the ecliptic we would have an eclipse at every full moon. But as it is actually considerably inclined, the moon usually passes north or south of the shadow, and so escapes eclipse.

At the present full moon the moon's path leads almost centrally through the shadow, and she is completely immersed in it for an hour and a half. The circumstances of the eclipse are as follows, the dates being given in Eastern standard time:

Moon enters penumbra October 16, 10:17 P. M.

Moon enters shadow October 16, 11:17 P. M.

Total eclipse begins October 17, 12:19 A. M.

Total eclipse ends October 17, 1:48 A. M.

Moon leaves shadow October 17, 2:50 A. M.

Moon leaves penumbra October 17, 3:50 A. M.

It is well visible throughout the United States, though on the Atlantic coast the eclipse will not be over until quite late.

There is little to be seen till some time after the moon enters the penumbra, but before she reaches the shadow proper the darkening on her eastern limb begins to show. The shadow itself looks almost black at first; but after a little the edge of the eclipsed part of the moon begins to show. Its color is grayish near the edge of the shadow, but farther in it is deep coppery red.

This illumination is due to sunlight refracted into the shadow by the earth's atmosphere, which acts like a lens. Since this light has traversed many miles of air it is colored in the same way as that of the setting sun. Most of the light near the edge of the shadow has passed through but little air and is therefore not much colored; but near the center we get the full benefit of the sunset tints.

The brightness of the eclipsed moon varies greatly in different years, depending on the weather in the region where the light passes through our atmosphere. When this is cloudy much of the light may be cut off, as in 1884, when the moon was quite invisible to the naked eye.

Though the edge of the shadow seems sharp to the naked eye, it appears very hazy in the telescope. This effect is also due to our atmosphere, and deprives lunar eclipses of much of their astronomical value, as, if the phases could be sharply observed, they could be used to determine longitude.

On October 30 there is a partial eclipse of the sun, invisible in this country, but visible in eastern Europe and throughout most of Asia.

THE HEAVENS.

At 9 P. M. on October 15 Cygnus is some distance west of the zenith. Lyra and Hercules are below it on the west, and Aquila on the southwest. Aquarius and Capricornus are nearly due south. Below the former is Fomalhaut, the only conspicuous star in the southern sky, and above it is Pegasus. Andromeda, Perseus and Auriga extend northwestward from the last-named constellation. South of them lie Aries and Taurus, the last just rising. Pisces and Cetus fill the southeastern sky. Cassiopeia is above the Pole on the right, and Ursa Major below on the left.

THE PLANETS.

Mercury is evening star until the 19th, when he passes inferior conjunction and becomes a morning star. Being south of the sun he can hardly be seen, except at the very last of the month.

Venus is morning star. She is steadily approaching conjunction, rising over an hour before the sun on the 1st, and only half an hour before him on the 31st.

Mars is morning star in Leo, rising about 2 A. M. On the 19th he passes close to the bright star Regulus, being about 1 deg. north of it.

Jupiter is evening star in Capricornus, and is on the meridian soon after dark. He is bright enough to cast shadows which can be seen faintly out of doors and easily in a darkened room when the planet shines in the window.

Saturn is evening star in Sagittarius. On the 15th he is in quadrature with the sun and is due south at 6 P. M.

Uranus is in Ophiuchus, and is low in the southwest after sunset.

Neptune is in Gemini, and comes to the meridian at about 4 A. M.

THE MOON.

New moon occurs at noon on the 1st, first quarter at noon on the 9th, full moon at 1 A. M. on the 17th, last quarter at 6 P. M. on the 23d, and new moon again at 3 A. M. on the 31st. The moon is nearest us on the 19th and farthest away on the 7th. She is in conjunction with Mercury on the 3d, Uranus on the 7th, Saturn on the 10th, Jupiter on the 11th, Mars on the 26th, Mercury again on the 29th, and Venus on the 30th.

THE FIRST MAP BEARING THE NAME OF AMERICA.

BY A. GEHLEN.

We all have learned as boys at school that Columbus, the discoverer of America, was deprived of the honor of having the newly-discovered continent called after his name by the German geographer Martin Waldseemüller. It was in his book "Cosmographiae Introductio," published at St. Dié in the year 1507, that this scientist first proposed the name "America" for the new land in honor of Amerigo Vespucci, of Florence. The famous passage reads as follows: "Quarta pars (i. e., of the earth) per Amerigum Vesputium . . . inventa est, quam non video cur quis inre vetet ab Americo inventore. . . . Amerigen quasi Americi terram sive Americam dicendam, cum et Europa et Asia a mulieribus sua sortita sint nomina." ("The fourth continent was discovered by Amerigo Vespucci; and I do not see why one should have any just reason against it, that this country should be called after its discoverer the land of Amerigo or America; for Europe as well as Asia have received their names from women.")

But where was this name of the new world first practically used? What map first bore the name of America?

A. von Humboldt in his "Critical Researches" (Berlin, 1852) still maintained that the map of Apian of the year 1520 had this honor. Scientists, however, soon agreed that there must have been even earlier maps that contained the name "America," and Prof. Elter (De Henrico Glareano, Bonn, 1896) demonstrated that a map of the geographer of St. Dié must have existed as far back as the year 1507, and that this was the first map that contained the name of America, the later maps (also that of Apian) being to a great extent copies of it. Elter even gave hints for its reconstruction.

But where was this map to be found? To discover it was regarded among specialists as the highest prize of untiring historico-geographical research.

Then quite unexpectedly in October, 1901, German and soon also American journals brought the news that the map of Waldseemüller, so long forgotten, had at last been found. The fortunate discoverer is the Rev. Joseph Fischer, S. J., Professor of History and Geography at the Stella Matutina College at Feldkirch (Vorarlberg). The recent book of this scientific geographer on "The Discoveries of the Northmen in America"* gives us further information on this interesting subject.

Engaged for more than seven years in scientific investigations on the discoveries of the Northmen in America, Fischer searched either personally or through his friends in different libraries and archives of Germany, Austria, Italy, France and Belgium for documents bearing on the subject of his investigations. How much new material and how many documents he has found, how many questions in the interesting controversy of the Norse discoveries he has solved or brought nearer to their solution, is evinced in every part of his book.

The most remarkable discovery, however, was that of two large maps of Waldseemüller of the years 1507 and 1516 respectively. Fischer himself thus narrates his discovery:

On the third day of my systematic searching in the library of Prince Waldburg in the Castle Wolfegg, I discovered a codex in large folio with the inscription 1515, containing besides others two large maps of the world. Each of the maps covers twelve pages, about 580 millimeters in length and 420 millimeters in breadth. The first four pages form the upper part, the following four the middle, the last four the lower part of the map. The two maps together, therefore, comprise 24 pages. This valuable codex was formerly in the possession of John Schöner, the famous mathematician and cartographer. On page 9 Fischer found printed in large letters the name "America." Then followed on the next three pages the title in large capital letters: "Universalis Cosmographia secundum Ptholomaei traditionem et Americi Vespucii aliorumque lustrationes." ("Universal Cosmography, According to

*Joseph Fischer, S. J. Die Entdeckungen der Normannen in America. Unter besonderer Berücksichtigung der Kartographischen Darstellungen. Mit einem Titelbild, zehn Kartenbeilagen und mehreren Skizzen. Freiburg, Herder, 1902.

the Traditions of Ptolemy and the Voyages of Amerigo Vespucci and Others.")

The second map bore on the upper margin likewise in big capitals the title in Latin: "Marine sailing chart, giving the general outlines of the voyages of the Portuguese, as well as the shape and nature, the situation and the boundaries of every known sea and land, as explored in our own times, and differing from the traditions of the ancients, and not mentioned by any of the olden writers." As to the time of the production of the second map, page 20 mentions expressly that it was printed "on the vigil of Pentecost, 1516." On the following page a long inscription was found beginning with the words: "Martinus Waldseemüller (!) Ilacomilus lectori felicitatem optat incolumem." ("Martin Waldseemüller wishes the reader unimpaired happiness.") The Carta marina, therefore, was a map of Waldseemüller. And this was affirmed on page 24, which at the same time contained the place where the map was printed.

It was not so easy to determine the first map which bore the title "Universalis Cosmographia." But that also this was a work of Waldseemüller, and that it was completed several years before the Carta marina, was evinced by the legends of both maps; that it is of the year 1507, and that it also was printed at St. Dié, was established by Fischer together with his former teacher, Prof. Wieser, of the University of Innsbruck, an authority of the first rank in the science of cartography. Details about it will be given in the preface to the publication in which Fischer and Wieser are about to communicate to the world in fac-simile reproduction the two famous maps so long lost.

Suffice it to say for the present that the famous "Cosmographiae introductio," the writing accompanying the map, already proves its genuineness; all the statements of the "introductio" are verified on the map: the papal keys, the imperial eagle, the crescent, the crosses signifying dangerous places, the name America, etc.; the Cosmographiae introductio is nothing else than an explanation of this map.

It is interesting to remark that on Waldseemüller's map of the world (Cosmographia universalis) North and South America are separated by an arm of the ocean; that in his Marine Chart (Carta marina) the continent opposite the island Isabella (Cuba) is called Terra de Cuba, Asiae partis, that therefore Waldseemüller was still of the same opinion as Columbus, that the newly discovered countries formed the eastern coast of Asia.

Still more interesting is the fact that the German geographer in his second map tried to right the wrong he had done to Columbus. The name of America is here replaced by "Brasilla sive terra papagalli" (parrot's land), and in a legend added to the map Vespucci is named in the third place, while Christopher Columbus is mentioned first: "Hec per Hispanos et Portugalenses frequentatis navigationibus inventa circa annos Domini 1492, quorum capitanei fuere Cristoforus Columbus Ianuensis primus. Petrus Aliares [Cabral] secundus. Albericusque Vesputius tertius." ("These countries were discovered in several voyages about the year of the Lord, 1492, the captains being, first, the Genoese Christopher Columbus, next Peter Aliares (Cabral), and thirdly Albericus Vespucci.")

But it was too late! The map of 1507 (one thousand copies of which had been printed) and the accompanying Cosmographiae introductio had already spread the name "America" far and wide.

A New Comet Discovered.

A comet was discovered by Grigg at New Zealand on July 22. The predicted place for September 17 was in right ascension 15 hours, 37 minutes and 16 seconds, and in declination 7 deg. 58 min.; daily motion in right ascension + 2 minutes 32 seconds; daily motion in declination — 0 deg. 7 min. The brightness has rapidly decreased. This predicted position is but a rough approximation.

The Laying of a British Pacific Cable.

The steamship "Colonia," the largest of all cable vessels, reached Esquimaux on September 13, having on board 3,450 miles of cable. The cable steamship "Anglia" is to meet the "Colonia" at Honolulu. The "Colonia" will lay her cable from Bamfield Creek to within 100 miles of Fanning Island, where the end will be buoyed and moored. The connecting link will be laid by the "Anglia."

Another Transatlantic Record.

The "Kronprinz Wilhelm," of the North German Lloyd Company, has broken the western transatlantic record, held for two years by the "Deutschland," by about 26 minutes. The "Deutschland's" record was 5 days, 12 hours and 29 minutes from Cherbourg; the "Kronprinz Wilhelm's" new record is 5 days, 11 hours and 57 minutes. The daily runs of the "Kronprinz Wilhelm" were 349, 574, 574, 581, 573 and 396 miles.