The Heavens in October

Recapture of the Tiny Planet 1911 MT.

By Henry Norris Russell, Ph.D.

EASILY first in interest among the astronomical announcements of the past summer is the recapture—if we may so speak—of the very remarkable asteroid known as 1911 MT.

The history of this little body has afforded quite an astronomical romance, which nearly turned out, as has been well said, to be an astronomical tragedy.

On October 3d, 1911, Prof. Palisa of Vienna, a distinguished observer of the minor planets, while observing another object, noticed that one of a pair of faint stars in the field of view of his telescope had changed its position relative to the other. A few minutes measures showed which one was moving, and made it clear that an object of unusual interest had been discovered; for the new asteroid was moving rapidly southward and eastward.

The little planet was almost in opposition to the Sun; and when in this relative position, practically all the known planets and asteroids seem to move westward. They are all really moving eastward, it is true, around the Sun; but the eastward motion of all previously known planets (except Eros near perihelion) is slower than that of the Earth, so that we leave them behind, and they seem to move toward the west.

The news of the discovery was spread abroad by telegraph, and on the following night another observation was secured by Palisa, and two by Pechule at Copenhagen, but then bad weather set in; the Moon came along and made the sky too bright to see faint stars; and, after she had gone, the new planet was lost, and could not be recovered, though photographs of the region in which it might be expected to be, were taken with powerful instruments.

So the situation remained for several months. The existing observations of the asteroid were confined to two days, and did not afford enough material for the computation of a reliable orbit by the ordinary methods. However, an attack on the problem was made by Mr. Haynes of the University of California, using certain very powerful methods of calculation developed by Prof. Leuschner of that university, and he succeeded in getting an approximate orbit, which was published last April. From this an approximate ephemeris of the planet's track was calculated, and, when this was available, images of the planet were found on three plates taken at Greenwich on October 11th, and on one obtained at Heidelberg on October 17th. These images were faint, and had previously been overlooked, but were found when it was known approximately where to search for them.

With the aid of these observations, Mr. Haynes has computed a second and much more accurate orbit, and an improved search ephemeris. Thanks to this, the planet has been identified on a plate taken at Heidelberg in the middle of September, and one exposed at Johannesburg on October 18th. With this interval of a month between our extreme observations, a good orbit can be obtained; and it is possible that still more observations may turn up, for the planet was well placed in the northern sky, and fully as bright as at discovery, all through August and September, and more images may be found on plates exposed for other purposes to the proper region of the sky.

The orbit of this remarkable member of our solar system is shown in the accompanying illustration. It is remarkable for its

great eccentricity, which exceeds that of any previously known planet. When nearest to the Sun, it is but 110,000,000 miles from him, and about 19,000,000 from the Earth's orbit, while its greatest distance from the Sun is 366,000,000 miles, and its distance from the Earth may reach 459,000,000.

The orbit is inclined nearly 11 degrees to the plane

Orbits of the Earth and Planet 1911 MT.

of the ecliptic, crossing it at the points marked A and B in the figure, so that when nearest the Sun it is north of the Earth's orbital plane, and a little farther from our track than the diagram would indicate.

At the time of discovery it had just passed as near the Earth as it could possibly come—as the figure shows, by giving the positions of the two bodies on October 3d, 1911 (the discovery date) and on August 29th, when the planet was nearest the Sun. The planet's motion in this part of its orbit is actually faster than the Earth's motion, which accounts for its apparent eastward motion in the sky. As the two swung farther around their paths they rapidly separated, which caused a steady decline in the apparent

brightness of the planet, which explains why it was so nearly lost.

This little planet must be one of the very smallest bodies so far known to astronomical observation. When discovered, at a distance of only 23,000,000 miles from us, it appeared to be of the twelfth magnitude, in spite of the very favorable conditions. If in opposition, at its average distance from the Sun, it would be more than one hundred times fainter, and of magnitude 17.5, hardly visible with the great Yerkes telescope, and just accessible photographically with the most powerful instruments, if its apparent motion were not so rapid. When remotest from the Sun, its magnitude, even if the Earth was most favorably placed, would be 19.8—so faint that, even if fixed in the heavens, it could be photographed only with the great Mount Wilson reflector; and, considering its motion, would be beyond even its powers.

It can probably be observed only when in the nearest third of its orbit to the Sun, and then only when the Earth happens to be on the same side of the Sun as the planet. According to Mr. Haynes' calculations, it should return to its perihelion in October, 1915; but observations covering only two weeks give but a slender basis for prediction of a planet's place four years ahead, and it may be necessary to keep a sharp lookout (photographically) on the planet's track for months around this date.

The actual diameter of the new planet can only be estimated by comparing the amount of light which it reflects with that which we would receive from Mars or Mercury at the same distance; and in this way it may be estimated that it is only three or four miles in diameter, a mere speck compared with the extent of interplanetary space.

The curious name of this little body deserves explanation. When the discoveries of asteroids became numerous, fifteen years or so ago, they were provisionally denoted by letters, A, B, C, etc., the assignment of names and of permanent numbers being reserved until reliable orbits could be calculated. The alphabet was soon exhausted; then pairs of letters were used—AA, AB, to AZ, BA, BB, etc. Two or three years ago this arrangement ran out; and then it was decided to begin again with AA, but to prefix the date of discovery. Hence, the present planet is called 1911 MT to distinguish it from one with similar letters in the earlier sequence, discovered some years ago. It will probably not be long before it receives a permanent number and a name.

The principal astronomical event of the coming month will be the total eclipse of the Sun on October 10th, which is visible in a small part of the southeastern United States as a partial eclipse just after sunrise. The track of total obscuration begins in the Pacific, off the coast of Nicaragua, crosses South America from one point in Ecuador a little north of Quito to one in Brazil a little south and west of Rio de Janeiro, after which the whole course is lost in the South Atlantic. The greatest observable duration of totality is about 1 minute 50 seconds, on the Brazilian coast. It is to be hoped that weather conditions may favor the observers of this eclipse better than they did last year in the Tonga Islands, when clouds almost completely

THE HEAVENS IN THE REGION OF PEGASUS AND PISCES

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The Panama Canal

Issue of November 9, 1912

The time is drawing nigh when the Panama Canal will cease to be a vision and will become a reality. No engineering work in the entire history of the world is of greater magnitude. For decades statesmen and engineers have urged the digging of a waterway which would unite the Pacific with the Atlantic.

The Panama Canal is a monument to American engineering genius. To describe it adequately the SCIENTIFIC AMERICAN will devote to it the issue of November 9th—the November magazine number. How the great locks were constructed in which ocean-going steamers will swim, how a mountain was cut in two to make way for the Canal, how great steam shovels that scoop up five tons of dirt at a time dug out the bed of the waterway, and how landslides—avalanches, containing millions of cubic yards—were coped with, all this will be told. Our editor, Mr. J. Bernard Walker, made a special trip to Panama in order to gather much of the material which will appear in this number. He spent several weeks at the Isthmus, studied every square inch of the ground, spoke with the men who are doing the great work—Col. Goethals, Col. Gorgas, and the rest—and brought with him facts which have not yet found their way into print, and which will first appear in the SCIENTIFIC AMERICAN.

consumed. You find that by making the cost to the consumer bear some relation to the cost of rendering the service, you stimulate the use of current during the day when your plant would ordinarily be loaded but very little, and thus by encouraging the use of current for many hours each day you have put your plant on a self-supporting basis, and have satisfied the consumers by giving them a lower average rate for current because they use it for other than lighting purposes.

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The Heavens in October

(Concluded from page 282.)

obscured the Sun, though other parts of the sky were clear.

The Heavens.

We give again this month a detailed map of a portion of the sky which is now well observable in the evening. The principal configuration shown in it is the great square of Pegasus, near the middle. Apart from this, it is one of the poorer regions of the sky, being remote from the Milky Way, and rather sparsely sown with stars. Among double stars in this region visible in a small telescope we may note Epsilon Pegasi (not far from the western edge of the map, just south of the parallel of 10 degrees declination), which has a companion of the ninth magnitude, more than two minutes of arc away—too wide to be really called a double star, but a pretty object; Mu Cygni (about 20 degrees north of the last) a binary pair, now separated by about 2 seconds, and closing up; and Zeta Aquarii, another fine slow binary pair, separated by 3 seconds, which may be found almost on the celestial equator in 22 hours 22 minutes Right Ascension.

Of the constellations in other parts of the sky, Cetus and the Southern Fish are conspicuous, low in the south; Aquila, Cygnus and Lyra in the west; Ursa Minor and Draco in the north, with Ursa Major on the horizon, Perseus and Auriga in the northeast, and Aries and Taurus in the east, while Gemini and Orion are rising.

The Planets.

Mercury is theoretically a morning star until the 4th, and an evening star afterward; but he is too near the Sun to be observable.

Venus is evening star in Libra and Scorpio, setting about 6:30 P. M. in the middle of the month, and visible in the twilight.

Mars is approaching conjunction with the Sun, and though theoretically an evening star, cannot be observed.

Jupiter is evening star in Ophiuchus, setting about 7:50 P. M. on the 15th.

Saturn is in Taurus, approaching opposition, rises at 7:20 P. M. on the 15th, and is well observable in the latter part of the evening.

Uranus is in Capricornus. He is in quadrature with the Sun on the 23d, crossing the meridian at 6 P. M.

Neptune is in Gemini, and is also in quadrature, on the opposite side of the Sun, on the 19th.

The Moon is in her last quarter at 2

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P. M. on October 3d, new at 7 A. M. on the 10th, in her first quarter at 7 P. M. on the 17th, and full at 8 P. M. on the 25th. She is nearest the Earth on the 7th, and farthest away on the 19th. As she passes round the zodiac, she comes into conjunction with Saturn on the 1st, Neptune on the 4th, Mercury and Mars on the 10th, Venus on the 12th, Jupiter on the 14th, Uranus on the 18th, Saturn again on the 28th, and Neptune on the 31st.

Gale's Comet.
A comet, visible to the naked eye, was discovered by Gale of Sydney, Australia, on the morning of September 9th. On the 17th it was in 14 hours 27 minutes R. A. and 25 degrees 6 minutes south declination, and was moving northeastward at the rate of about 1 1/4 degrees per day. It is not yet observable in our northern latitude, but will probably be so in a few weeks, though until its orbit is computed no definite predictions can be made.
Princeton University Observatory.

Selling Agent Must Not Imitate His Principal's Goods or Trade-mark

JUDGE MAYER, of the United States District Court for the Southern District of New York, has recently issued an injunction in a suit brought by the Gund Manufacturing Company against the Strauss Manufacturing Company, the Ideal Novelty and Toy Company and George Borgfeldt & Co., restraining the defendants from making or selling merchandise which in appearance simulates the appearance of the merchandise of the Gund Manufacturing Company, or from using in connection with any similar merchandise the trade-mark of the complainant or any simulation thereof, and further from imitating the advertising matter of the complainant. This decision is important to manufacturers and manufacturers' agents, and in brief it is to the effect that one who has as a manufacturer's agent offered for sale and sold the goods of a manufacturer for and on account of the manufacturer, must not after the account is taken from him offer for sale similar goods bearing trade-marks like those of the manufacturer or use in connection with such goods advertising matter such as he formerly used in selling such goods.

The facts of the case are these: The Strauss Manufacturing Company was under contract with the Gund Manufacturing Company, to sell a certain toy in the shape of a duck which, when drawn over the ground, opened and closed its bill and gave forth a sound such as "quack-quack." The trade-mark applied to such ducks was "Duckie Doodles," and in presenting them to the trade, certain fancy circulars were used containing catch phrases such as "A Live One," "The Duck That Quacks," and others. After the contract was taken from the Strauss Manufacturing Company, the Gund Manufacturing Company learned that it had made arrangements with the Ideal Novelty and Toy Company to make up some ducks like those of the Gund Manufacturing Company, had applied to such ducks the trade-mark "Duckie Waddles," and had copied the advertising circulars containing the catch phrases above noted and had delivered to George Borgfeldt & Co. a sample of the imitation ducks, which last company was offering them to its customers and soliciting orders.

The Gund Manufacturing Company, through its attorney, Mr. Charles A. Munn, filed a bill of complaint joining all of these parties as defendants, and asking for an injunction, which was granted by Judge Mayer after a full hearing. Judge Mayer remarked at the hearing that the defendants must not make or sell any duck imitating in appearance the duck of the Gund Manufacturing Company.

The decision of Judge Mayer is in all respects in accord with the decisions of the same Court in the automobile lamp and horn cases, and the coffee mill case, and indicates that all unfair practices in competition in trade will be restrained.

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