ASPECTS OF THE PLANETS FOR FEBRUARY.

VENUS

is morning star, and stands first on the February list, not only because she crowns "the smiling morn with her bright circlet," but also for the incidents she contributes to diversify the planetary history of the month. On the 16th, at 2 o'clock in the morning, she reaches her greatest western elongation. She is then 46° 52′ west of the sun, and, bound to him by an invisible chain, can go no farther. The inner or inferior planets move in this way, oscillating in straight lines east and west of the sun. It is easy to keep the run of these movements, especially in the case of Venus. Those who were eye-witnesses of the transit have a tangible standpoint from which to commence observation, and can readily follow the planet's path until in September she reaches superior conjunction with the sun, and is hidden from view in his radiant beams. Half of her synodic period is completed, as well as her role of morning star. She then passes to the sun's eastern side, becomes evening star, and repeats the same phases in reversed order until she again reaches inferior conjunction. Her whole course is then completed, that is, as she appears to move when viewed from the earth, and she begins over again her unswerving routine among the stars. Thus, on the 6th of December, Venus passed between the earth and the sun, the passage being witnessed by millions of observers. Since that time, she has been moving westward from the sun, rising earlier every morning, passing her period of greatest brilliancy, and turning, like the new moon, more of her illumined face toward the earth.

On the 16th, a change occurs. She reaches her extreme western limit, ceases her retrograde or backward motion, and becomes stationary for a time, as she is traveling directly from us. She then takes on her direct motion, making her way back toward the sun. Observers who watch her course will see that from inferior conjunction to western elongation she rises earlier every morning, and moves with rapid pace. After elongation, she rises later every morning, and moves more slowly, until, at superior conjunction, she rises and sets with the sun.

Seen in the telescope, Venus retains the crescent form until elongation, when she takes on the beautiful phase of a half-moon. After that, she appears in gibbous form until superior conjunction, when her whole disk is illumined like the full moon. She would then be a glorious object in our sky, but she dwindles to small proportions on account of her great distance. For she isone hundred and sixty million miles away, instead of twenty-five million miles, her least distance, and her apparent diameter is 10″ instead of 64″.

On the 20th, at 5 o'clock in the morning, Venus is in conjunction with the small star, Pi Sagittarii, passing 1° 30′ north. The right ascension of Venus on the 1st is 17 h. 49 m., her declination is 19° 10′ south, her diameter is 29·8″, and her place is in Sagittarius.

Venus rises about eight minutes after 4 o'clock in the morning; at the end of the month she rises at a quarter after 4 o'clock.

MARS

is morning star, and gets up a small incident to enliven his monotonous way. He is in conjunction with swift footed Mercury on the 13th, at 6 o'clock in the morning, being 4° 23′ south. The conjunction ranks among invisible phenomena, both planets being too near the sun to be seen. But none the less surely does it take place, for in the risings and settings, the meetings and partings of the planets, there is no change, no shadow of a turning from the accurate calculations that astronomers are able to make for years ahead.

The right ascension of Mars is 20 h. 4 m., his declination is 21° 21′ south, and his place is in Capricornus.

Mars rises now about half past 6 o'clock in the morning; at the end of the month he rises a few minutes before 6 o'clock.

URANUS

is morning star, and is fast approaching the point where he is in the most favorable condition for being seen with the naked eye. He is on the border land between Leo and Virgo. Those who have small telescopes will easily pick him up by sweeping the sky in the vicinity, for he will show a pale sea green disk as soon as he comes into the field of vision, entirely different from the twinkling points around him. Denebola is the nearest bright star in his vicinity, several degrees north.

The right ascension of Uranus is 11 h. 34 m., his declination is 3° 35′ north, his diameter is 3·8″

Uranus rises about half past 8 o'clock in the evening; at the end of the month he rises about a quarter before 7 o'clock.

MERCURY

is evening star until the 5th, and morning star the rest of the month. On the 5th, at 6 o'clock in the evening, he is in inferior conjunction, passing between the earth and sun. If he were then at or near one of his nodes, he would make a transit precisely as Venus did on the 6th of December. As he will not reach his descending node until twenty-three days later, he will pass above the sun and the passage will be invisible. Mercury will not make a transit until the 9th of May, 1891. Transits of Mercury, though much more frequent, are considered of far less importance than those of Venus. Mercury looks much smaller than his fair neighbor as he makes his way over the sun's face, and can never be seen with the naked eye in transit. After inferior conjunction, Mercury passes to the sun's western side, and becomes morning star. The last week in the month, he may be seen rising an hour before the sun, four degrees north of the sunrise point. His conjunction with Mars on the 13th has been referred to.

The right ascension of Mercury is 21 h. 31 m., his declination is 11° 37′ south, his diameter is 9·8″, and his place is in Capricornus.

Mercury sets a few minutes after 6 o'clock in the evening; at the end of the month he rises about half past 5 o'clock in the morning.

JUPITER

is evening star, and ranks *facile princeps* among the three thousand stars that are visible at one time on exceptionally clear nights to observers blessed with good eyes, well trained to note the stars. Nothing on starry pages now open before us is more beautiful than the view he presents through nearly the entire night, as he leads the glittering host of twinkling mysteries from east to west in the grand procession of the azure vault of the sky. He was brighter at perihelion in 1880, but he never was more beautiful, and never trod the heavens with more regal step than he has done and will do in the first two months of the present year.

The right ascension of Jupiter is 5 h. 23 m., his declination is 22° 57′ north, his diameter is 42·4″, and his place isin Taurus.

Jupiter sets about 4 o'clock in the morning; at the end of the month he sets about a quarter after 2 o'clock.

SATURN

is evening star, and, though still a lovely object in the heavens, glowing with soft, serene light, is perceptibly decreasing in size and luster as he travels from the earth and approaches the sun. This is not strange, for on the 8th, at 6 o'clock in the morning, he arrives at quadrature, being just half way on his course from opposition to conjunction. He is then 90° from the sun, rises about noon, and sets about midnight. His motion during the month is direct, and he is traveling northward.

The right ascension of Saturn is 3 h. 10 m., his declination is 15° 32′ north, his diameter is 17·4″, and his place is near the border line between Aries and Taurus.

Saturn sets at a quarter after 1 o'clock in the morning; at the end of the month he sets at forty-nine minutes after 11 o'clock in the evening.

NEPTUNE

is evening star, and reaches quadrature on the 4th, at 11 o'clock in the evening, four days before Saturn and under similar conditions. He is still very near Saturn, there being only thirteen minutes' difference in the time of transit. Neptune will be of little account until September, except to follow in the mind's eye his unseen course in the heavens. Discovered in 1846, he will not complete a revolution round the sun since he became a known member of the solar brotherhood until 2011, seven years after the next transit of Venus.

The right ascension of Neptune is 2 h. 56 m., and his declination is 14° 57′ north.

Neptune sets at 1 o'clock in the morning; at the end of the month he sets about a quarter after 11 o'clock in the evening.

THE MOON.

The February moon fulls on the 21st, at thirty-four minutes after 7 o'clock in the evening. She appears in only three phases during the shortest month of the year—as new moon, at her first quarter, and as full moon. The waning moon is near Venus on the 4th, the crescent and the morning star being only one degree apart. On the 6th she is near Mars, and on the 7th she is near Mercury. On the 13th she is near Neptune and Saturn. On the 16th she passes at her nearest point to Jupiter, and on the 23d she is near Uranus.

When the moon is in conjunction with a planet, she is in the same right ascension or longitude, though she may be several degrees north or south of the planet. As the moon moves eastward at the average rate of 13° a day, she must, during a revolution, pass near all the planets, in the order of their position in regard to the sun. Thus the old moon, fulfilling her course for the present month, passes near the morning stars—Venus, Mars, and Mercury—on the sun's western side. The new moon of the 7th, in the same way, is near the evening stars—Neptune, Saturn, and Jupiter—on the sun's eastern side, and completes the list by her conjunction with Uranus two days after the full. The various phases and motions of the moon form an astronomical study as easily understood and plain to the unassisted eye as it is varied and interesting.

UTILIZATION OF ANTS IN HORTICULTURE.

BY PROF. C. V. RILEY.

Rev. Dr. H. C. McCook has published in the "Proc. Ac. Nat. Sc., Phil.," 1882, pp 263–271, a most interesting paper on "Ants as Beneficial Insecticides.' He was led to discuss the question by an article from Dr. C. J. Magowan, which appeared in the *North China Herald* of April 4, 1882, and of which I published a short abstract in *Nature* of June 8, 1882. It appears that in parts of southern China the custom has long prevailed of using ants as a means of protecting the orange trees from the ravages of certain worms. For this purpose the orange growers import from the neighboring hills two species of ants which construct bag-like nests suspended from the branches of various trees. These ants are trapped by means of pig or goat bladders baited inside with lard and applied with their orifices to the entrance of the ants' nest. When the ants have entered the bladders, they can easily be transported and colonized on the orange trees. Bamboo rods are then stretched between the different trees, so as to give the ants easy access to the whole orchard.

Speaking first of the advantage which plants derive from the domiciliated habits of ants, Dr. McCook first raises the question as to whether the known domicile habits of ants are favorable to their encouragement by horticulturists, and brings together a number of interesting facts as to nest-building species. He enumerates the arboreal species which are known to science, and among the few that construct nests like the Chinese species, only two belong to the North American fauna, both occurring in Mexico. No mention is made, however, of the nest-like structures built by several ants occurring in the United States around twigs or among leaves. Mr. Walsh (*Practical Entomologist*, ii., p. 41) thus observed a species of *Myrmica* ("probably the *lineolata* of Say") building cases around the twigs of the red osier dogwood, and another undetermined species of *Formica* surrounding willow twigs with tent-like structures. Another undetermined species I find quite commonly making nest-like structures on blackberry bushes infested with the blackberry flea louse (*Psylla tripunctata*) and a pale aphid, which live in the crumpled leaves. While these structures may not be called perfect nests, and appear to be built mainly for the protection of aphides, still the fact that the ants are thus "domiciliated" bears on the subject here under consideration. Nor is any mention made by Mr. McCook of the *Azteka mirabilis*, Smith, perhaps the most striking instance on record of protection afforded to a tree by a species of ant domiciliated upon it, of which Dr. Fritz Muller has given us such a vivid picture in his paper, "Die Imbauba und ihre Beschutzer" (*vide Kosmos*, vol. iv., pp. 109–115). This species, already observed by Humboldt, inhabits the natural capacious cavities in the stems of the older imbauba or candelabra trees (*Cecropia*) in South America. Almost every full grown tree contains, according to Fritz Muller, its colony of azteka, and no such tree is ever known to be attacked by the formidable leaf cutting ant which likes to defoliate young imbaubas not yet inhabited by the azteka. Other enemies of young imbaubas, especially a weevil of the genus Baridius, are kept away from older trees by the aztekas, which derive from the tree shelter as well as nourishment, both without injury to the tree.

Dr. McCook further shows that ants are generally carnivorous; that there are species beneficial to agriculture, *e.g.*, the cotton ant, *Solenopsis xyloni*, McC.; and finally that there would be no serious obstacles in the way of successful introduction and colonization of the Chinese ants.

While I agree with these statements, and while I take it for granted that the Chinese arboreal ant is beneficial to orange culture in its native home, still, the question of its introduction is a more serious one than would appear at first glance. The introduction of any species of insect involves many consequences that cannot be predicted with certainty, as experience has already demonstrated. Not only does change of conditions often produce change in habit, but the introduction of a species sometimes very curiously affects the native species. There are species in which we cannot imagine that any change of habit would take place in consequence of their being transplanted to foreign countries, *e. g.*, hymenopterous parasites, and I would unhesitatingly favor their introduction. But in the case of a formicid it would be impossible to predict the consequences of its introduction. There is already one instance on record of an unforeseen inconvenience resulting from the introduction of an ant. A correspondent of *Nature* (June 15, 1882, pp. 159–160) calls attention to the following extract from Tennent's "Natural History of Ceylon," taken from the *Ceylon Observer* for April 26: "To check the ravages of the coffee bug (*Lecanium coffeæ*, Walker), which for some years past has devastated some of the plantations in Ceylon, the experiment was made of introducing the red ants, which feed greedily upon the coccus. But the remedy threatened to be attended with some inconvenience, for the Malabar coolies, with bare and oily skins, were so frequently and fiercely assaulted by the ants as to endanger their stay on the estates"

To return to the particular case of the proposed protection to our orange tree by the introduction of the Chinese ant, it is to be remarked that the principal enemies to that tree in our country are not "worms," but various species of scale insects, all other orange insects being of secondary importance. It has never been proved that ants prey upon and destroy scale insects, and for this simple reason the introduction of the Chinese ant would not be likely to produce any favorable results.

CUT OR UNCUT.

The appearance of the SCIENTIFIC AMERICAN is so much improved when delivered to subscribers with the leaves uncut that for the last two or three issues we have followed that mode of publication. The uncut form is also quite desirable for the neat binding of the paper. We have received, however, a few letters from subscribers and advertisers who say that they much prefer to have the edges of the paper trimmed, as heretofore, owing to its greater convenience. If there are others who share in this preference, we shall be glad if they will signify to us their wishes by a postal card. We should like to have as general an expression of the desires of our readers as possible; and if we find that any considerable number of them prefer to have the leaves cut, we shall try to accommodate them.