Silkworm Breeding.

BY PROFESSOR CHAS. V. RILEY.

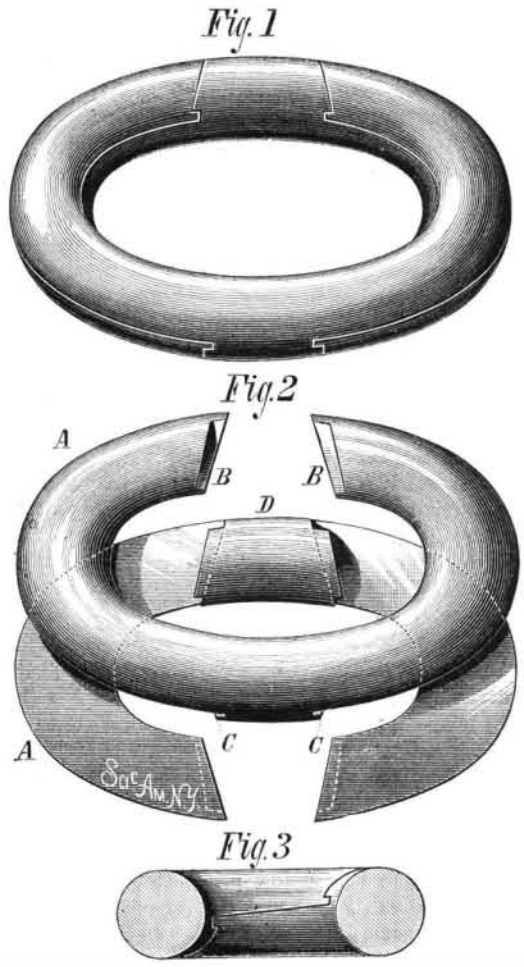
The possibility of producing two annual yields of raw silk, which you refer to in your issue of August 10th, cannot be considered a discovery, and will certainly create no change in the production of silk. In all silk growing countries, races of worms that are single, double, or treble brooded, that is, which produce one, two, or three generations annually, have been known for centuries. In France they are termed respectively *annuel*, *bivoltin*, and *trévoltin*. As a rule the eggs of the annuals cannot be made to hatch the same season they are laid, no matter how manipulated; but occasionally an exceptional batch will hatch, and by changed conditions any race may, in a few years, be rendered inconstant and variable. Quite a number of a white annual race, which had bred constant for seven years under my care, produced last summer a second generation; while some eggs of the same race, that had been attached to some woodwork of an apartment that was subsequently kept warm throughout the winter, did not hatch till the leaves began to unfold the next spring. Of the eggs obtained from the progeny of the second generation above mentioned, but about five per cent hatched this summer—the rest failing to hatch though exposed to the full heat of the past month—an interesting case of atavism or reversion to the more normal habit of the race. While some of the digoneutic races are reared at Milan and other places where the summers are pretty equable, they have not been found as profitable as the annuals, the summer generations proving less healthy and productive than the annuals reared in spring. What is true in this respect for Europe and Asia is fully as true for America. At the Department of Agriculture the present year there has been a good illustration in point. A number of worms of different races were fed on various species of *Morus* and a large number on *Maclura*. The worms were very much crowded and not as thoroughly cared for as they should have been. Yet, all things considered, they did remarkably well. A small lot of a digoneutic race were hatched later, and though receiving the greatest care, with plenty of room, one half of them perished ere spinning, and the rest formed small and very slight cocoons. The heat of July is too great for their well-being.

Washington, D. C., August 3, 1878.

WOOD'S LAP RING.

The engraving represents a new form of lap ring, which is made without pivotal connections. When it is in use it is securely locked, so that the parts cannot become accidentally disconnected.

The sections, A A, are both exactly alike, both being cast from the same pattern. Each section is open at the center at one side, and the opening converges toward the outer side of the ring. Tongues, B, are formed on ends of each section, which are fitted in grooves, C, in the raised solid center portion, D, of the other section.



WOOD'S LAP RING.

The sections of the lap ring are readily connected by sliding one of them over the other until the solid middle portion of each section enters the opening in the other section. This ring is very easily applied to chains or tackling, and forms a reliable connection, which may be easily disconnected without the use of tools of any sort.

Patented through the Scientific American Patent Agency, May 28, 1878, by Mr. Henry S. Wood, of Rob Roy, Ark., from whom further particulars may be obtained.

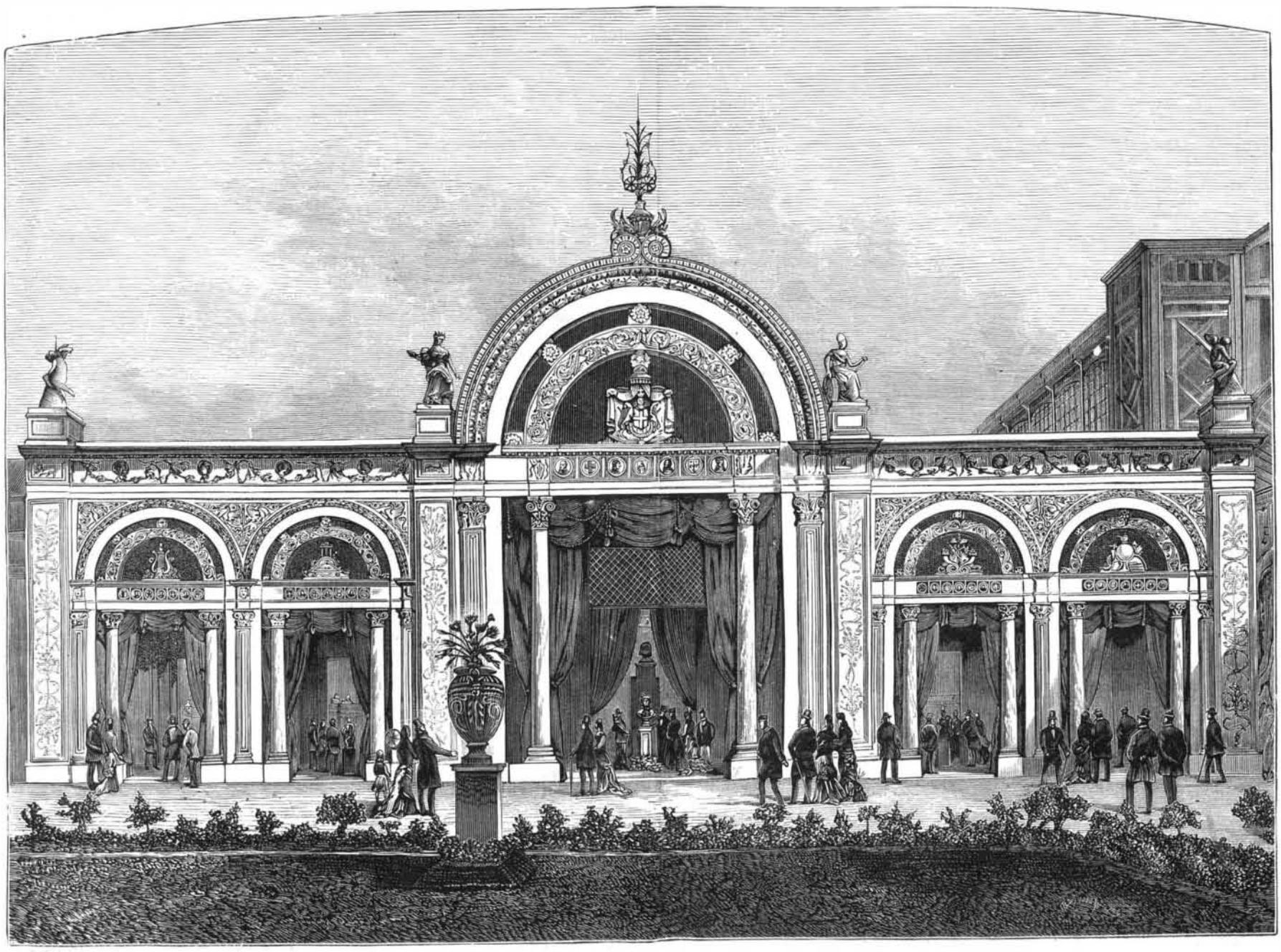
PARIS EXHIBITION.—THE ITALIAN FACADE.

The Italian façade presents a series of five arches, the central arch being nearly twice the height and width of the other four arches, the whole length of this façade being 32 meters, or 104 feet. The central arch is twofold, that is to say, with two concentric arches in the archway, which rises to the height of 30 feet. The arches are constructed of white marble and terra cotta intermixed; their span is traversed, in each opening, by a horizontal piece of marble, in which are inserted mosaics representing the portraits of illustrious Italians, poets, artists, and historians, the arms of Italian cities, and other subjects; other decorations, in black and white, are introduced above or at the sides. The central arch is supported by terra cotta pilasters and two pillars of stucco colored green to imitate cipollino marble. Heavy red curtains are suspended within the arches, and a few statues are placed there. We take our illustration from the London *News*.

Hardy Catalpa Trees.

A correspondent inquires what we know about "the hardy catalpa." There is but one species of catalpa that we know of. Some have believed they have a variety that blooms a little earlier than the other, and this may be; it is also said that one variety grows straighter than the other. We can only say there are trees in Pennsylvania, four and five feet round, that have endured winters when the thermometer indicated 20 below zero, and are as straight as gun barrels. We do not know in what respects the "hardy" and "straight" catalpa is hardier or straighter than these, and should be glad to know.

There is one point worth noting. In some situations the catalpa, in common with the pawlownia, chestnut, and other trees, dies back the first year, and often the second; or if not dying right down, loses its terminal bud, and this makes the stem a little crooked. If we were growing catalpa for timber we should let it grow as it will for two or three years, and then cut clean to the ground, a clear straight sprout, ten, fifteen, or even twenty feet high, being the result; and it goes on without dying back after. We have seen catalpa that made a sprout fifteen feet high and ten inches round, in one season, when cut back in this way.—*Gardener's Monthly.*



PARIS EXHIBITION.—THE ITALIAN FACADE, CHAMP DE MARS.

Natural History Notes.

Foliation and Defoliation of Plants.—"Foliation" is the starting forth of leaves, and "defoliation" their natural falling off. "Exfoliation" should properly mean their artificial stripping off, but in English the word has a different signification· the French, however, have a word to express this, derived from the same roots—"effeuillaison." M. De Candolle has undertaken to examine, from certain known data, as well as from observation and experiment, whether there exists any relation between these three facts or phenomena. The following are his conclusions:

1st. On comparing a large number of ligneous species with caducous leaves, no direct and regular ratio can be discovered between the time of foliation and defoliation.

2d. In species where the phenomena of foliation and defoliation sensibly differ between individual and individual, in the same locality and under the same influences, it is sometimes found that the earliest individuals (lindens, for example) in spring are the latest in autumn; but in other species (chestnut and elm, for instance), there is no regular and habitual ratio between these two phenomena: from which it must be concluded that, in spite of exterior resemblance, the interior organization of the leaf is not identical in the individuals of these species.

3d. When one individual differs from others of the same species as regards the time of foliation, this peculiarity shows itself constantly from year to year.

4th. The total stripping (*effeuillaison*) of a ligneous plant in autumn retards the subsequent evolution of the leaves in the spring.

5th. The stripping of a branch in autumn may, or may not, produce the same effect, according to the species or by reason of other circumstances as yet unknown.

6th. The persistence until spring of the dried leaves on certain beech trees agrees with the retardation of the subsequent leafing.

Moulting of the Bill in the Puffin.—The current number of the *Zoologist* contains an interesting notice of a remarkable discovery made by Dr. Bureau in regard to the moulting of the bill and palpebral appendages in the Common Puffin (*Mormon arctica*). These birds, which are confined to the Arctic regions, on the coasts of America and Europe, assemble in spring for reproduction. They are then all of the same plumage, and wear the same adornments. The cheeks are of a grayish white; the beak elevated, and thick on a level with the nostrils; a plait at the base of the upper mandible; the lower mandible curved regularly; the eyelids vermilion, adorned with two horny plates; a large rosette of a bright yellow at the gape. By the middle of July the young are fledged, and at the middle of August the puffins are out at sea, and not a bird is to be seen on the rocks which up to this time were so full of life. Soon the winds of winter begin to blow, and after some fearful gales hundreds of the dead and dying birds are brought ashore by the waves. The puffins thus cast ashore on the French coast in winter are clad in a plumage different from that worn in the breeding season. In the orbital region they have a spot more or less large, of a dusky brown; they have not the red eyelids, nor the horny plates above and below the eye, nor have they the puckered yellow skin at the base of the bill; and what is still more remarkable, the bill is differently formed; it is neither of the same size, shape, nor color, and the pieces of which it is composed are not even the same. It is small, sliced off in front, wanting the plait at the base, and flattened laterally on a level with the nostrils, where a solid horny skin of a bright lead-color is replaced by a soft grayish membrane. Hitherto authors have considered the puffins found in this state to be the young, of different ages, of *Mormon arctica;* and indeed it has been proposed to separate them specifically under the name of *Mormon grabæ*. However, the discoveries of Dr. Bureau have shown that neither of these views can be admitted. He had for some time been convinced that these different appearances were due to a metamorphosis, and on July 1st, 1877, a specimen was sent him, undergoing the process, thus confirming his suspicions. He lost no time in visiting the breeding places of the birds, at the Ile de l'Océan, where he found them in great abundance. Almost all the specimens shot were in full metamorphosis, changing under his very eyes to what some authors have considered the young of *Mormon arctica* and others the adult of *Mormon grabæ*.

The *Zoologist* reproduces Dr. Bureau's colored plate, where by means of movable pieces the complex phenomenon of this bill moulting is shown. The author observes that the adult bird owes its summer dress to phenomena of three kinds—hypertrophy, formation of horn, and coloration; and loses it under the influence of three inverse phenomena, namely, atrophy, loss of horny substance, and loss of color. He concludes by showing that analogous phenomena occur in the allied species of this bird.

Comet Forms of Star Fishes.—In a recent number of the *Zeitsch. wiss. Zool.*, Haeckel draws attention to these forms, and the support which the facts recently established as to the power possessed by certain star fishes of multiplying by throwing off their arms, lends to his theory of the origin of the *Echinoderma* by the continually increasing integration or centralization of a radially-connected colony of worm-like individuals. The phenomenon of self-division across the disk has been observed by Lütken and Konalewsky; the production of "comet-form" depends, however, on the separation of single arms, which then reproduce the whole disk and remaining arms by budding. Martens, in 1866, observed this in the case of a *Luidia* in the Red Sea. Konalewsky found it was a common process with similar species in the same locality. Sars observed it in *Brisinga*. Huder has described the regular occurrence in *Labidiaster* of a spontaneous casting off of the arms, but not the regeneration of the disk and arms on the separated arms. Sir John Dalyell observed the whole process of reproduction of the disk on a single detached arm of an *Asteracanthion*.

The Original of the Cultivated Potato.—A potato plant (*Solanum Fendleri*) growing in great abundance in northern New Mexico is supposed to be the original of our cultivated potato. This native plant forms one of the chief articles of diet of the Navajo Indians. The squaws dig up the small tubers with whatever implements they can obtain, often using a strong, smooth piece of wood with a wedge-shaped end. The plant grows on low, rich spots, and by spring the earth is turned up in every conceivable direction in the search for the potatoes. The latter are from one-half to three quarters of an inch in diameter, and of good flavor—tasting somewhat like boiled chestnuts. The Navajo Indians consume such large quantities at a time as to cause griping pains, and as a remedy take at the same meal a quantity of earthy matter containing magnesia, which relieves the stomach. Some years ago a quantity of the tubers of this species of potato were received and distributed by the Department of Agriculture. Reports from various localities stated that, in many cases, these improved under cultivation, and increased largely in size.

Labor and Wages in Bordeaux.

According to the report of United States Consul Gerrish, Bordeaux, with 150 workingmen's societies, has thus far been exempt from strikes, or other reckless action, by any class of laboring men. They are more patient, orderly, and prudent than the workingmen in other parts of Europe. Bordeaux suffers from an unusual number of cafés—nurseries of idleness, but not of drunkenness. Light wines and beer are the common beverages. Although rum, gin, and brandy are to be had at low prices, they are rarely used. Saving societies exist to some extent among the laborers, encouraged, in some instances, by wise and benevolent capitalists.

Farm laborers are frequently so economical as to become quite wealthy proprietors. They are paid 380 to 420 francs a year, lodged and boarded; if not boarded, but are lodged, they receive as high as 800 to 850 francs per annum. Day laborers, without board, receive 2½ to 3 francs a day, with a bottle of wine. A suit of clothes costs 15 to 20 francs. Coopers, ship carpenters, and foremen in wine cellars, by great frugality, attain a condition of comparative independence. The average wages of mechanics may be stated at 4 to 4½ francs per day—an increase of nearly 1 franc since 1873. The cost of living has not increased, but rather decreased. In 1875 the decrease was notable in bread, meat, and potatoes. A government cigar factory was established here in 1816. It employs 150 men and 1,400 women. The men earn about 5 francs and the women 2 francs a day.

The value of the tobacco used is 15,000,000 francs annually, much of which is imported directly from the United States. Over 700 cooper shops exist in the district, employing more than 4,000 men. The number of casks made annually is 1,200,000, and their value 17,000,000 francs. The staves come principally from the borders of the Baltic and the Adriatic. A few come from the United States. More would be imported if they were not so bunglingly made. It is alleged that it takes a third longer to prepare an American stave than it does one from the Adriatic. They should be split, not sawed. About 15,000,000 bottles are made annually in the city by seven factories, employing 700 workingmen, who are paid by the 100 bottles, and who earn as high as 12 francs per day, according to their skill. Four factories, with 300 men earning from 3 to 6 francs per day, make 3,400,000 white glass preserve jars and perfumery bottles. At least one third as many more are imported. Only a fraction of the number of corks used in Bordeaux are made there, say 10,000,000. Cork cutters receive 2 to 2½ francs per 1,000. 100,000,000 of corks are imported. More than 1,200 persons are engaged in the manufacture of *liqueurs* and *confitures*. In the autumn, double the number are employed. Men earn from 3 to 4 francs per day, and women about half as much. The annual value of these products is 10,000,000 francs.

A Contrast.

One strictly American idea—the elevated street railway—is not likely to be adopted in any city of Europe. Foreigners are lost in amazement as they read of the inroads made by the elevated lines in New York on the property, the comfort, and all the rights of the people. They cannot understand how and why we tolerate such trespassers. In London, where rapid transit is in operation to an extent elsewhere unknown, the elevated road, of the pattern with which we are too familiar, would cause a riot if not a revolution. The Englishman, with his lofty notions of individual rights, would not stand it a moment. No British capitalist or speculator is bold enough to start such a scheme at home. They come for it to New York, where the people are so used to misgovernment and railway usurpation that they have almost ceased to resist.

We hear much from the great stockholders of the elevated lines about the discomfort and many inconveniences of traveling on the London underground lines. To these interested statements the best answer is the steadily increasing patronage of those lines. In order to meet the public demand new routes and connections have been planned in London—all underground. Even less of a habitual growler than John Bull could find some objections—though mostly trivial—to this class of railways. It may be freely admitted that, for the passengers alone, traveling underground, though in the best ventilated tunnels and the most perfectly lighted cars, is no pleasanter than a trip on an elevated road. Safer it undoubtedly is. But the comfort and pleasure of passengers are not the only things to be consulted. And there is just where Englishmen and Americans are taking different views of rapid transit. In London everything is not sacrificed to the passengers. The people dwelling along the route are taken into account also. The roads are built underground (as a first reason) because they would there cause the least possible annoyance to the inhabitants of the streets whose crowded traffic they were designed to relieve. In this city rapid transit has been handled wrong end foremost; the passengers and the money the jobbers can collect from them are considered first, last, and always, and the property owners and lessees along the lines are nowhere.—*New York Journal of Commerce.*

ASTRONOMICAL NOTES.

BY BERLIN H. WRIGHT.

PENN YAN, N. Y., Saturday, August 24, 1878.

The following calculations are adapted to the latitude of New Yorkcity, and areexpressedin true or clock time, being for the date given in the caption when not otherwise stated.

PLANETS.

	H.M.		H.M.
Venus rises	3 10 mo.	Saturn in meridian	2 00 mo.
Jupiter in meridian	9 51 eve.	Neptune rises	9 32 eve.
Saturn rises	8 02 eve.		

FIRST MAGNITUDE STARS, ETC.

	H.M.		H.M.
Alpheratz rises	5 59 eve.	Procyon rises	3 04 mo.
Algol (var.) rises	7 39 eve.	Regulus	invisible.
7 stars (Pleiades) rise	9 58 eve.	Spica sets	8 29 eve.
Aldebaran rises	11 18 eve.	Arcturus sets	11 09 eve.
Capella rises	8 45 eve.	Antares sets	10 29 eve.
Rigel rises	1 28 mo.	Vega in meridian	8 20 eve.
Betelgeuse rises	1 13 mo.	Altair in meridian	9 32 eve.
Sirius rises	3 29 mo.	Deneb in meridian	10 24 eve.
Mira (var.) rises	10 12 eve.	Fomalhaut rises	8 39 eve.

REMARKS.

Venus, Jupiter, and Saturn are the only planets now visible to the naked eye; Mercury, Mars, and Uranus passing the meridian nearly at noon. Venus and the moon will be in conjunction August 26, 4h. 4m. mo. When they are nearest, Venus will be close upon the moon's southern limb, and both bodies will be exactly one hour high. Mira Ceti, the "wonderful star of 1596," began to increase in brilliancy August 18, and will continue growing brighter until October 1, when it will probably be about 2·9 magnitude, remaining thus for fifteen days. Its maximum brilliancy is thought to vary from 1·5 to 5·0. It will be interesting to follow this variable through its changes.

The Arabian Cure for Hydrophobia.

Les Mondes states that M. Reiche has recently addressed a communication to the Entomological Society of France on a subject of practical entomology of so interesting a nature that it deserves to be made known.

M. Reiche says that his colleague, M. De Saulcy, sent him some fragments of beetles that he had received from Cabes, in Tunis. In regard to these his correspondent, M. Chevarrier, writes him as follows:

"I send you herewith the remedy of the Arabs against hydrophobia. It consists of specimens of two species of scarabs given to me at the south of Ouderna by a man of the tribe of the Amernas; he has a dozen of them, which he preserves as something very precious. In presenting them to me he detailed their virtues and explained the manner in which they are used. On my return to Cabes I spoke of this remedy to a very intelligent Arab, who assured me that all the statements of his countryman were true, and that these beetles were recorded in their medical works, where may be read that the *Dernona* (the insect) cures hydrophobia if administered within twenty days after a person has been bitten. The dose is a piece the size of a grain of wheat, to be given to the patient in a bit of meat.

"These insects possess powerful vesicating properties, judging from what the Arabs told me, and it would endanger the patient's life to increase the dose too much. The Arabs are unanimous in affirming the efficacy of this remedy, which will act, however, only during the eighteen or twenty days subsequent to the biting. It scarcely admits of a doubt that the remedy occasions dreadful attacks of colic, and, being extremely powerful, should be administered only with the greatest prudence."

M. Reiche states that the fragments which were sent him are those of coleoptera of the species *Meloë tuccius* and *Mylabris tenebrosa*, belonging to the family of blistering beetles, and well known as powerful vesicants. Their congeners are common in France (and America), and it would be well to try a modification of the remedy by using for this purpose, say, the common Spanish fly (*Cantharis vesicatoria*).

It is possible that the terrible though happily rare affection, hydrophobia, might be averted by the internal use of vesicants, which, according to the facts given, would seem to be capable of destroying or neutralizing the virus of the disease. It should be remarked that the use of *Meloë* (espepecially *M. proscarabæus*) as an antidote to hydrophobia was long ago recommended, and that M. Fermaire communicated to the society in 1856 a pamphlet by Saint-Hombourg treating of this very subject.