CALCAREOUS SPONGES.

This group of sponges received its name from the crystalline calcareous deposits scattered throughout the entire body of the sponge, and forming a skeleton similar to those formed by the silica composing the greater portion of silicious sponges. These calcareous deposits are formed by slender needles arranged in groups of from four to six each around a common center. The sponge possesses a small quantity only of organic tissue, and therefore on drying the sponges retain their original shape and size, and present, whether alive or dead, a chalky appearance.

The most elaborate monograph of calcareous sponges is that of Haeckel, the naturalist, in which he proves beyond doubt that the so-called one hundred and eleven species of calcareous sponges sent to him from all parts of the globe cannot be considered distinct species, but that they possess the capability of adapting themselves in form and structure to the variable conditions presented by different localities. Haeckel has, however, for the sake of convenience, divided these species into several families, the structural differences of which evince a progressive tendency from the simple to the complex. We are acquainted with the successive stages of development of a few species only, and of these the most important one is that of the larvæ.

If a calcareous sponge arrived at maturity, which is generally the case in May, is cut in slices or torn apart in small species, the larvæ are liberated and may be observed by means of a good microscope. They consist of two portions, differing greatly in appearance. One of them is composed of long conical cells carrying a long thread each (Figs. 1 and 2). The other consists of a number of round cells, rendered opaque by granular deposits.

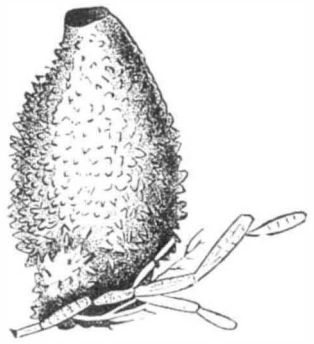


Fig. 3.—*Leucandra penicillata.*

Shortly after separating from the mother sponge the larva attaches itself to a rock. The threads attached to the cells of the upper half disappear, and the interior of the conical cells rapidly fills with calcareous crystals penetrating soon to the surface. An aperture is formed, lined by masses of crystals; the sponge grows and hardens gradually. The following spring it sends forth swarms of larvæ, which are carried to great distances by the sea currents.

The larger quantity of the water necessary for the maintenance of sponge life is alternately drawn in and ejected through pores scattered throughout the superficial crust of the sponge. Of these sponges there are three groups—bag sponges or ascones, bulb sponges or leucones, and honeycomb sponges or sycones. Bag sponges form closed or open cylinders, the walls of which are very thin. They are frequently so small and tender that they are hardly noticeable. Often a number of cylinders are united together, forming agglomerations of the size of the fist. To this family belong the beautiful *Ascetta clathrus* found plentifully in the Gulf of Naples and the *Ascaltis botryoides*, met with in the Northern seas.

The second family is characterized by an excessive development of the calcareous deposits. Among the most common representives of this family is *Leucandra penicillata*, illustrated in natural size by Fig. 3.

The highest degree of development is attained by the third family. Numerous individuals are united so as to form round disks resembling a honeycomb. The individuals have the shape of an elongated cup, Fig. 4, or a cylinder resting on a short stem. The edge of the cup is lined with a row of long slender needles.

Haeckel speaks as follows of the conditions under which the calcareous sponges pass their semi-animal life:

Calcareous sponges are found only in the sea. Not a single species has so far been found in fresh water or even in the mouths of rivers. Not a single species has been met with in the Baltic, the waters of which are very poor in salt, and this is also the case in the fjords of Norway. Placed in freshwater they die in a short time. Water containing a large percentage of mineral substances in solution seems, therefore, to be indispensable for maintaining the life of calcareous sponges.

Most of the species so far examined have been obtained from considerable depths. To all appearances light is injurious to their development, as the larvæ invariably select dark, shady spots for permanent attachment.

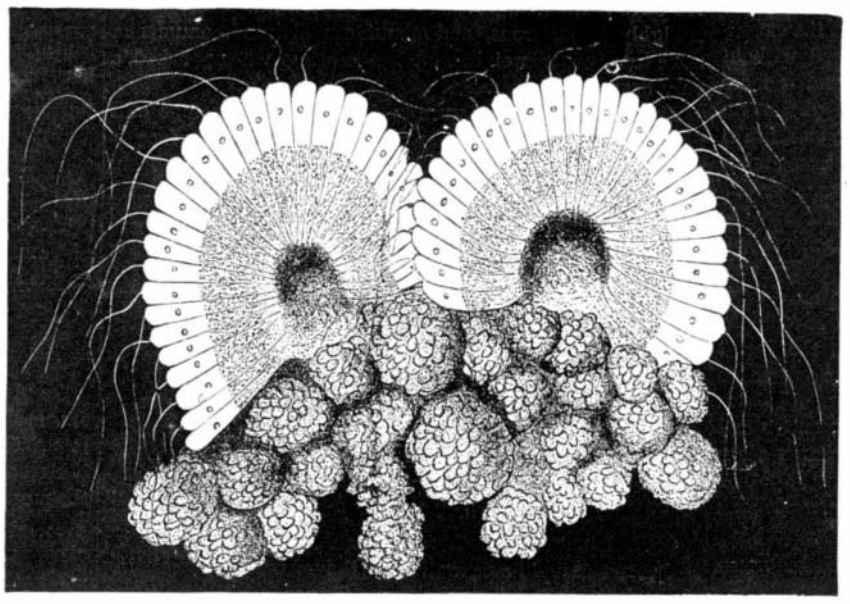


Fig. 2.—Transverse section of a twin individual of larva of *Sycandra raphanus*, 1 : 600.

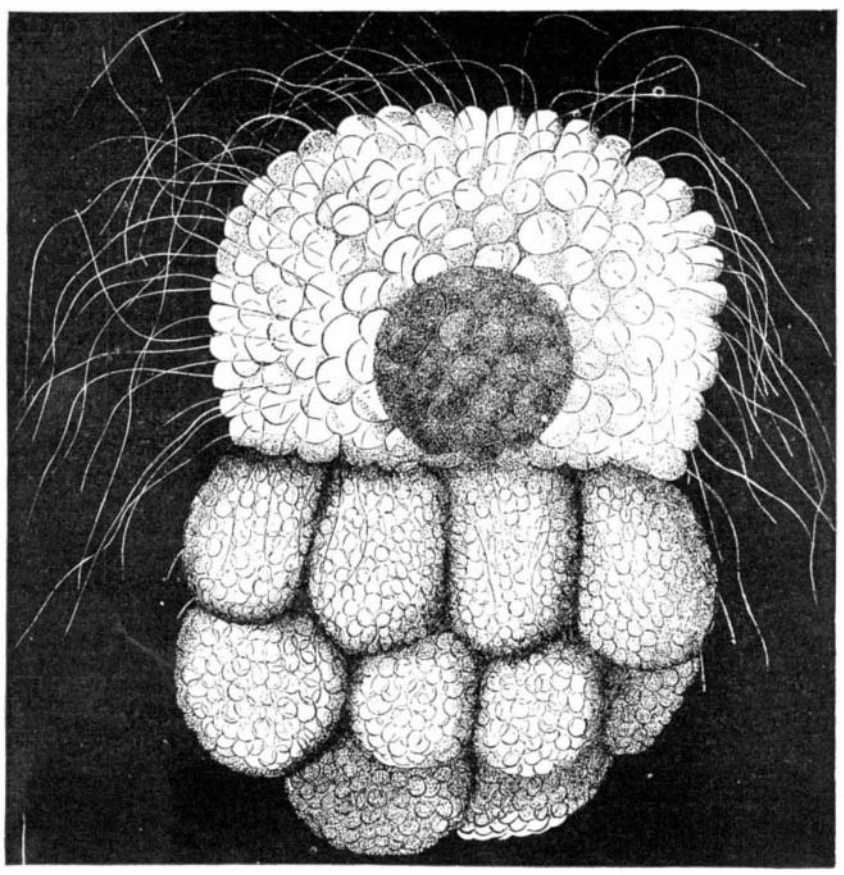


Fig. 1.—*Sycandra glabra*, 1: 600.

The Fruit of the Rose Bush as a Preserve.

Brillat-Savarin, in his "Physiologie du Gout," says that "the discovery of a new dish does more for the human race than the discovery of a star." If this be true, a writer in one of our French exchanges (*La Maison de Campagne*) has elevated himself above the average astronomer in announcing the discovery that the scarlet fruits of the rose bush, or "rose hips," as they are called, are capable of being made into most delicious preserves. Considering the fact that nearly every genus of the order *Rosaceæ* already furnishes man with delicious fruits, as strawberries, peaches, apples, pears, plums, etc., there is certainly no reason why the rose genus should not do so likewise. The fruit of every rose bush, says this writer, no matter what the species, provided it has single flowers (in other words, provided it is a wild species, for the flowers of the cultivated kinds are usually double), is good for preserving as soon as it has become ripe and tender. The essential point is to gather the fruit at the right moment, which, in the case of the sweetbrier (*Rosa rubiginosa*), would be in September. Gather the fruits, then, as soon as they have become soft, take out their seeds, put them in an earthen or porcelain-lined saucepan, and place them over a slow fire, having added just enough good wine vinegar to make them pass readily through a colander, after five minutes' cooking. Place them over the fire again, and add enough sugar to overcome the acidity of the vinegar, and let them boil again very gently, stirring all the while, until they become of a homogeneous and pasty consistency.

Put this in jars or wide-mouthed bottles, and it will keep indefinitely.

The author adds that preserved rose hips, properly prepared, give an exquisite flavor to sauces, go well with beef, veal, and chicken, and combine well with truffles and mushrooms; and that a dash of Madeira wine in no wise injures the preserve. Wild rose bushes exist everywhere, by the roadside and in fields, all over the country, and their fruit can be had for the gathering. It only remains for the American housekeeper to take the hint and try the experiment.

The Grape Phylloxera.

[Latest Facts about the Phylloxera: read by C. V. Riley at the recent annual meeting of the Missouri State Horticultural Society.]

The fact that about 280 tons of California grapes were received weekly and sold in the markets of Philadelphia during the past season, is sufficient to show that the grape interest in this country is increasing in importance, and to lead to the hope that the discouragement which the Missouri grape grower naturally feels, after four consecutive unfavorable seasons, must needs soon give way before brighter prospects that, it seems to me, are necessarily in store for him. One thing is sure, namely, that the interest manifested abroad in our American grape vines does not flag. These vines are constantly discussed in the foreign horticultural journals, while one periodical, entitled *La Vigne Americaine* (The American Vine), is entirely devoted to them. It is a source of no little satisfaction to me that the varieties which I first recommended, seven years ago, are in the main those still sought for and used by the French sufferers from phylloxera, as stock on which to graft their *viniferas*. It is further interesting to observe that the grounds which I took in regard to grafting above ground, in my 7th Report, pp. 108–116, are justified by the experience had during the last few years in France. Such grafting is found to be quite practical, notwithstanding the want of faith shown in it by our earlier ampelographers.

I sincerely hope that this question of grafting the vine above ground as a means of evading the injuries of phylloxera, or of improving such varieties as do not succeed upon their own roots, will be discussed by your society, so as to bring out whatever experience on the subject the Missouri grape growers have had of late. The fears which I expressed in my 7th Report, as to the danger of the introduction and spread of the phylloxera in California, have also been more than justified, since many vineyards have already been seriously injured or totally destroyed by the insect. I am glad to be able to confirm, in this connection, the truth of the statement of Mr. P. J. Birckmans, of Augusta, Ga., namely, that this insect does not occur in that locality. While spending a few days with him last September, I was able to verify its non-occurrence there; and here let me remark that, however much contempt a Missourian may have for the Scuppernong, no one can witness the prolificacy or experience the delicacy and sweetness of such varieties as Tenderpulp and Thomas, as they grow in that region, without having a due appreciation of their value for the Southern States.

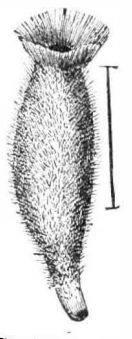


Fig. 4.—*Sycandra ciliata.*

Regarding the range of phylloxera, it had often been asserted that around Washington the root insect was not to be found. Yet I have found it extremely abundant, both in the vineyards of the district, and of those just across the line in Virginia, some of the latter suffering to such an extent that the crop was a failure, though the owners were unsuspicious of the cause.

After reviewing, in my 8th Report, all that was then known of the habits and natural history of the grape phylloxera, I drew certain practical conclusions, to the effect that complete knowledge of its habits, instead of simplifying its destruction, showed that it was almost if not quite hopeless to expect its destruction by any possible or practical means, and rendered preventive measures all the more urgent. I expressed my doubt as to the value of decortication of the vines, and the burning of the bark in winter, or by any means which aimed at the killing of the winter egg upon the branches and canes of the vine. Diligent search has failed to reveal these winter eggs in anything like the quantity one might expect, and the fact remained that the insect could go on propagating under ground for at least four years without the necessary intervention of the impregnated egg. Further researches, made since, confirm me in the belief that the normal mode of hibernation of the species is as a young larva upon the roots. From the results of the deliberations of the International Phylloxera Congress, held last summer at Lausanne, and that held at Montpellier, in France, it was conclusively proved that decortication, as I had anticipated, was of little or no avail.

Before leaving the question of phylloxera, let me briefly refer to certain theories first propounded by Prof. A. C. Cook, and that have been extensively promulgated during the past two years, as to the relation of phylloxera and grape-rot. I took occasion, last spring, to protest, in the New York *Tribune*, against the supposed connection between the two, and it will not be out of place to repeat the reasons:

"Already, in 1871, when I first announced the presence of phylloxera on the roots of American vines, and explained

the injury which it caused, there were writers who, not content with the simple facts, went much further and asserted that this little insect must also be the cause of mildew, rot, etc. Professor Cook has jumped to similar false conclusions, and has, during the present winter, promulgated before various societies his belief that the phylloxera is the cause of black rot in grapes. This is sensation, not science, and it is to be deplored, coming from the source it does. The phylloxera occurs in most grape-growing sections of the country east of the Rocky Mountains, and will quite naturally be found on vines on which the fruit has rotted.

"But an experience covering several years, and the examination of hundreds of vines, with rot of fruit and without it, enables me to deny the assertion that the insect is more numerous on the former than the latter. The phylloxera disease has its own peculiar characteristics, which are at once distinguished from other vine diseases by those understanding it. There are also very conclusive reasons for discarding the views of Prof. Cook. 1. In France, where the phylloxera has been so very destructive, the black rot has not accompanied or followed it. 2. The rot, so far as I have observed it, is no worse on the susceptible than on the more resistant varieties; while many cases might be adduced of healthy vines, and those least affected with the insect suffering most from rot. 3. On account of three successive wet summers of 1875, 1876, and 1877, in this part of the country (Missouri), the phylloxera has been less numerous and less injurious than at any time since 1871, and many vines that were suffering near to death have recuperated, yet no year since the time mentioned has black rot been worse than it was last summer."

Correspondence.

The Genesis of the Mosquito.

To the Editor of the Scientific American:

For several years past I have noticed in warm weather, that my wooden cistern, which is above ground, has been infested with peculiar looking little red worms. I have heard many others like myself complain of these worms, and I had taken it for granted that they were a species of earth worm. However, last summer I procured a glass jar and sprinkled the bottom of it with a very small quantity of sand and clay. I then half filled the jar with clear fresh water, and, after putting a dozen of these worms in the jar, I tied a piece of cloth over the mouth, and placed it in a light, airy place.

The worms were from half to three fourths of an inch in length, of a bright red color, and had rather a jointed appearance about the body. They would crawl on the bottom of the jar, swim through the water by a rapid bending of the body backward and forward, and occasionally come up to the surface of the water and float.

Within twenty-four hours after placing them in the jar, I noticed that they had all gone down to the bottom of the vessel, and had enveloped themselves separately in a kind of temporary shell made of earth and sand.

In a few days after this I saw one of these worms crawl out of his temporary house at the bottom of the jar, and swim to the surface of the water. Here, after twisting about for a few seconds, he ruptured a thin membrane that enveloped his body, and came out a full fledged mosquito ready for business. I noticed many of the other worms going through the same performance within a short while afterward. Some of the mosquitoes were much larger than others, but, as I have already stated, some of the worms were also larger than others.

F. W. COLEMAN, M.D.

Rodney, Miss., April, 1879.

Remedies for Carpet Beetles, Moths, etc.

To the Editor of the Scientific American:

At this season we are frequently besieged by inquiries in relation to the "carpet beetle," moth, etc. Many of your readers may be glad to know of the following simple remedies:

First.—Steep one quarter of a pound of Cayenne pepper in a gallon of water; add two drachms of strychnia powder. Strain and pour this tea into a shallow vessel, such as a large tinned iron milk pan. Before unrolling a new carpet, set the roll on each end alternately in this poisoned tea for ten minutes, or long enough to insure the saturation of its edges for at least an inch. After beating an old carpet, roll and treat all its seams and edges to the same bath. Let the carpet dry thoroughly before tacking it to the floor, in order to avoid the accidental poisoning of the tacker's fingers by the liquid. It is perhaps unnecessary to state that the residue of the liquid should be thrown out where it will not be drunk by any domestic animal, or if preserved for future use, carefully labeled "poison."

This preparation will not stain or disfigure carpets nor corrode metals in contact with the carpet, as will most preparations of corrosive sublimate.

Second.—One pound of quassia chips, one quarter of a pound of Cayenne pepper steeped in two gallons of water. Strain and use as above. This preparation. although irritating to the human skin, especially on cut surfaces, has the advantage of not being poisonous.

To either of these teas from one quarter to one half more boiling water may be added at the time of first using, if greater depth of the liquid in the vessel be required. When it is desirable to treat carpets that are not to be taken up, either of the above preparations may be applied by means of any of the common atomizers to every seam and margin with good results, although a second, and even third, application may be needed.

FRANCIS GREGORY SANBORN.
Consulting Naturalist.

Andover, Mass., April 10, 1879.

The Ice Cave of Decorah, Iowa.

To the Editor of the Scientific American:

"H. M. W." is mistaken about the formation of the Upper Iowa Valley, Winneshiek county, Iowa, where the Decorah Ice Cave is situated. It is in the Trenton limestone, which is highly fossiliferous, and manufactured into monuments, table tops, paper weights, etc., presenting, when polished, a very beautiful appearance.

The Ice Cave is a fissure in the Trenton limestone cliff facing to the south, and runs nearly parallel with its face, is about 100 feet long, and varies from 2 to 6 or 8 feet in width. Height irregular, in places compelling progression on hands and knees. Says White's "Geology of Iowa," vol. 1, p. 80: "The formation of the ice is probably due to the rapid evaporation of the moisture of the earth and rocks, caused by the heat of the summer sun upon the outer wall of the fissure and the valley side. This outer wall is from 10 to 20 feet in thickness where the ice is most abundant. The water for its production seems to be supplied by slow exudation from the inner wall of the cave." It forms the most rapidly during the extreme heat of summer, and disappears in winter entirely. From several years' acquaintance with the cave, I believe the above explanation correct.

A. M. M.

Waukon, Iowa, April 2, 1879.

C. B. A. submits another explanation, namely, that the ice is due to the rapid evaporation of the moisture percolating through the soil and rocks above. To produce the ice "two conditions are necessary: first, that the supply of moisture in the cave must not be (as it was when I visited it, a hot day in June, after much rain) great enough to warm the cave and thus overcome the cooling tendency of the evaporation to form ice or to melt the ice that may have been previously formed.

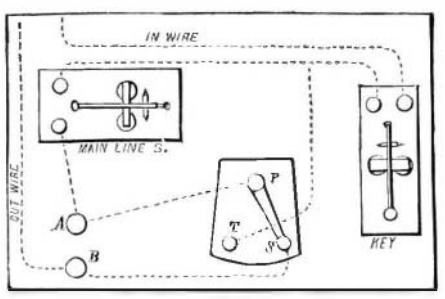
"Second, the supply of water must be sufficient to carry on the evaporation and leave a surplus for conversion into ice. This condition is met only during the summer months, when the temperature is high enough to create a current of air upward through the cave, and when supply of water is not so great as at other seasons. In the winter the ground is frozen and water prevented from soaking through, and so the ice formed in the summer evaporates. Also, the temperature outside and inside being so nearly the same, very little air passes through."

C. G. C. writes that a counterpart of the Decorah Ice Cave occurs on the south side of Black River, at Watertown, N. Y., the rock being the well known Black River limestone.

Telephones and Sounders.

To the Editor of the Scientific American:

As some of your readers appear to find difficulty in using telephones and sounders in the same circuit, I would recommend the following plan, which has been found to work well in practice upon a line where there are twenty offices, and nearly as many telephones in use:



The diagram shows the arrangement. The in wire, which comes from the zinc pole of the battery, is carried to the key and from the key to the relay or main line sounder, and thence to a binding post marked A. B is another binding post, from which the out wire goes to the line. P T S is a two point switch, one point of which, T, is joined to the wire between the key and sounder. P, the point on which the switch tongue turns, is joined by a wire to the post, A, and the point, S, to the post, B. All these connections are beneath the table, the posts, A and B, rising above, and in them the conducting cords of the telephone are inserted. When the switch tongue rests on S the sounder only is in cir cuit, and can be used to call. When the tongue rests on T the telephone is in circuit, and the sounder is cut out. When the telephone is not in use the switch should be kept on S, closing the circuit through the sounder and preventing waste of battery. Care should be taken that the Z pole of the telephone is attached to the post which receives the zinc wire from the battery, the post, A, in the arrangement as described. If desired, bells may be substituted for sounders.

JOHN E. NORCROSS.

Tracing the Hudson under the Sea.

The *Atlantic Coast Pilot*, published by the United States Coast Survey, explains the origin of the curious deep holes met with along the New Jersey coast, some distance out at sea. Of these "mudholes," as they are termed, nine are known to navigators, the deepest and the furthest out being the hundred and forty-five fathom hole, 83 miles southeast of Sandy Hook light vessel. These remarkable depressions, as the *Pilot* points out, bear the appearance of having been originally a continuation seaward of the Hudson River Valley. They were in all probability scooped out by the river being forced to run through narrow gorges. Several of these gorges can still be traced running almost parallel with the New Jersey shore line. In fact, the soundings along the coast would seem to indicate that the whole coast line, ages ago, was many miles seaward of its position to-day; that then the Hudson River entered the ocean at least a hundred miles southeast of its present mouth, and that the whole continent has since subsided, the sea encroaching further and further inland, as the country gradually sank.

Astronomical Notes.

OBSERVATORY OF VASSAR COLLEGE.

The computations in the following notes are by students of Vassar College. Although only approximate, they will enable the ordinary observer to find the planets.

M. M.

POSITION OF PLANETS FOR MAY, 1879.

Mercury.

On May 1 Mercury rises at 4h. 20m. A.M., and sets at 5h. 6m. P.M. On May 31 Mercury rises at 3h. 40m. A.M., and sets at 5h. 38m. P.M.

Mercury will be best seen near the middle of the month, in the morning, as it is then at its greatest elongation.

Venus.

On May 1 Venus rises at 6h. 45m. A.M., and sets at 9h. 54m. P.M. On May 31 Venus rises at 7h. 21m. A.M., and sets at 10h. 29m. P.M.

The motion of Venus among the stars from night to night is very perceptible. On May 21 it will be 4° south of Pollux in declination, and will precede that star by about 2° in right ascension. Venus and the crescent moon will be nearly in conjunction May 24.

Mars.

On May 1 Mars rises at 2h. 27m. A.M., and sets at 0h. 58m. P.M. On May 31 Mars rises at 1h. 22m. A.M., and sets at 0h. 51m. P.M.

Mars is very distant, but its ruddy color and its nearness to Jupiter on the morning of the 9th will cause it to be easily found.

Jupiter.

Jupiter is coming into a better position. It rises on May 1 at 2h. 35m. A.M., nearly with Mars; and sets at 1h. 25m. P.M. On May 31 Jupiter rises at 48m. after midnight, and sets at 11h. 47m. A.M.

Although Jupiter is in south declination, it is so large a planet that it will be very conspicuous in the early morning. Jupiter will be near the waning moon on the morning of the 14th.

Saturn.

Saturn rises on May 1 at 3h. 57m. A.M., and sets at 4h. 11m. P.M. On May 31 Saturn rises at 2h. 6m. A.M., and sets at 2h. 28m. P. M.

Uranus.

On May 1 Uranus rises at 0h. 47m. P.M., and sets at 2h. 16m. A.M. of the next day. On May 31 Uranus rises at 10h. 51m. A.M., and sets at 18m. after midnight.

Uranus follows the bright star Regulus on May 1 by 2° in right ascension, and is one third of a degree below it in declination. The position changes very little during the month.

Brorsen's Comet.

This small periodical comet has passed its perihelion and is approaching the earth. It resembles a nebulous star, and moves so rapidly by one and another star that with little optical aid the observer can see the change in an hour's watch.

Its motion is from the constellation Camelopardalus to that of Ursa Major. After April 21 the comet is circumpolar and does not set in this latitude. Following the ephemeris of Schulse, the comet will be nearest the earth on May 10. Its place at that time will be among the small stars in the head of the Great Bear.

How to Prevent Diseases among Children.

A correspondent of the New York *Times* says that he has followed a recommendation from a lady to evaporize a little carbolic acid daily in the heaters as a disinfectant and a preventive against contagious diseases, and the results have been most satisfactory. "I have a large school, and out of the whole number only two pupils have been sick with scarlet fever, and even these cases were indirect ones. In my own family, which consists of fourteen children—fortunately not all my own—and five adults, not one has been afflicted with any malady, not even with a sore throat, for longer than a day or two. We certainly keep the house minutely clean, ventilate it thoroughly every day, and never heat the rooms above 66° Fah. During my thirty years' experience I have never seen the like."

We think it probable that the use of a small quantity of carbolic acid in the manner above mentioned may in some cases be beneficial. But if it were the golden rule in every family to keep the house minutely clean, ventilate it thoroughly every day, and never heat above 66° Fah., there would probably be little need of carbolic acid or any other drug.