THE WINKLE, OR LADLE-SHELL.

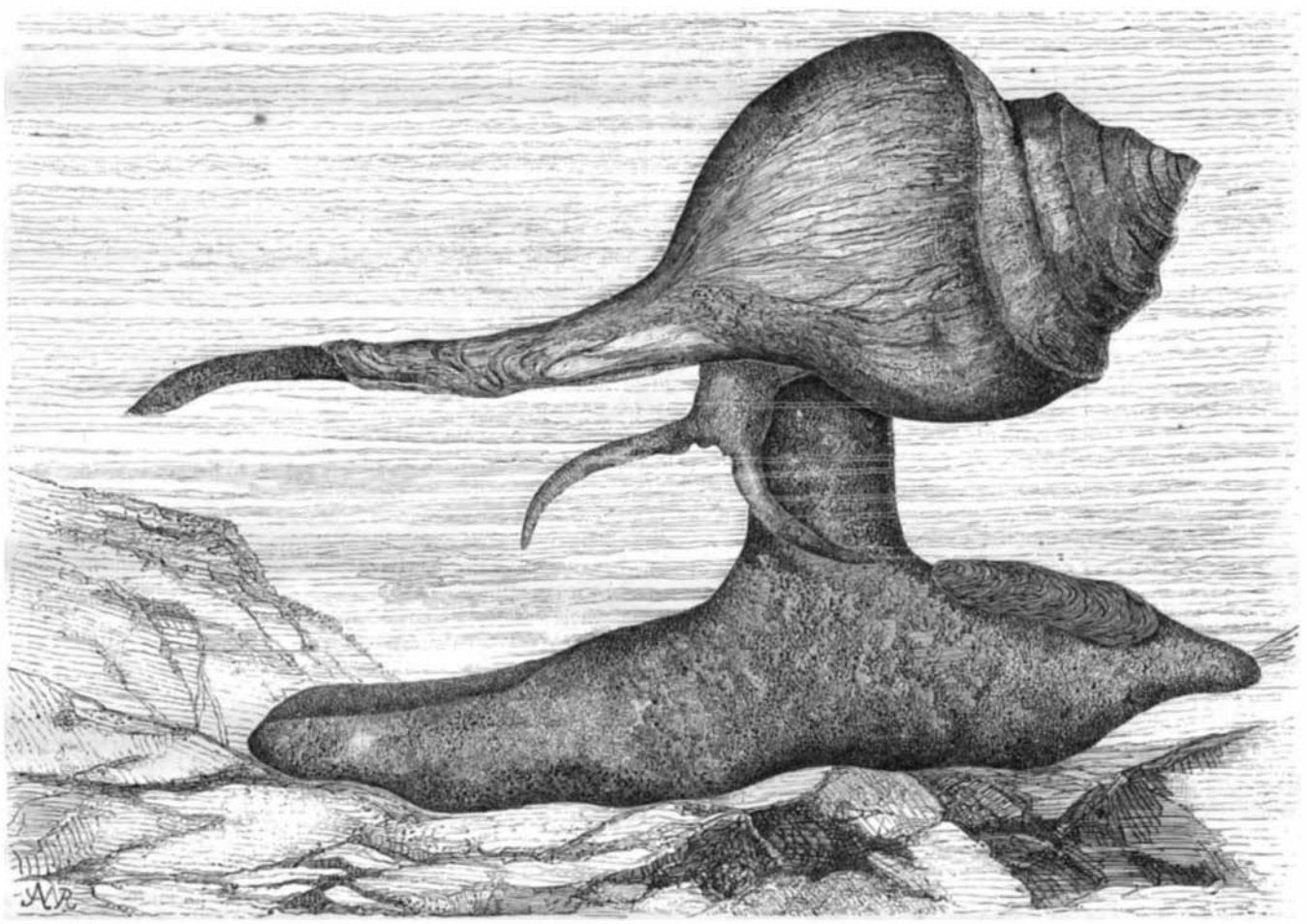
BY A. W. ROBERTS.

It is impossible to walk on the seashore without being struck by the many strange objects that are cast up and left by the waves only to be swept away again by the next high tide, which, in its turn, brings new and varied forms. A week may pass by without new objects appearing, but, during the next, strange and grotesque forms will be scattered profusely at one's feet. I once commissioned a fisherman friend to procure for me all curious objects that might be cast on his immediate shore. In course of time a parcel arrived, having a promising marine odor; which, on being opened, was found to contain some very interesting objects. Among them was one that, at first glance, might have been taken for a dead sponge, it being eight inches in length, of a light olive green color, and hollow at one end as many sponges are. But on closer examination it proved to be a skeletonized cabbage-stalk, on which was growing a dense and velvety growth of *Ectocarpus*. This I still preserve as a specimen of my earliest ocean acquaintances.

One of the most puzzling and at the same time the most common objects to be met with on our shores are strings of egg cases or capsules of the winkle (Fig. 1). These strings vary from 12 to 20 inches in length, and contain from forty to seventy-five capsules; the first few capsules on the string are always small and barren, the others contain from fifty to one hundred eggs. The young winkles remain in the capsule till all of a jelly-like substance with which each capsule is charged is exhausted, and upon which the young winkles feed. They are now strong enough to eat their way out at the apex of the capsule, where is situated an exit covered with a tough membrane. The young winkles, so soon as out, bury themselves in the sand, all but the extreme end of their siphons, through which they breathe.

When newly laid the egg cases are of a light creamy color. The tough leathery substance of which they are composed is so translucent that by holding it up to the light the eggs are plainly visible. These egg cases are deposited by the winkle when buried under the sand. Several deposits of eggs are made from March till late into the fall.*

It is astonishing that one winkle is capable of producing such an enormous quantity of capsules and eggs, the bodily mass of which seems to far exceed that of the body of the snail itself. Extending along the under surface of the body of the winkle is a long corrugated disk, which is very tough and rubber like. On this the winkle moves, and it is known as his foot. When withdrawing into his shell the foot is the last part of his body that is taken in. Attached to the back part of the foot (see illustration) is an oblong and strongly grained operculum, a horny valve or door that closely fits the aperture of the shell and completely closes it up when the animal is within. The winkle is provided with a large and powerful "tongue" or lingual ribbon, which bristles with thousands of silicious teeth; all these sharp denticles point backward, so that the tongue acts not only as a rasp, but takes a firm hold upon the food.



THE WINKLE, OR LADLE-SHELL.

By many fishermen the winkle is said to be an enemy to the oyster and other bivalves; this is not so, as the winkle frequents only sandy and muddy bottoms, where traveling is easy, and small crustaceans and marine worms, on which it feeds, are plentiful.

In making the illustration of the winkle I purposely placed one in a rocky-bottomed tank, which I knew would cause him to elevate his shell as high as possible to avoid breakage. On no account does the winkle like a rough, rocky bottom, or one composed of sharp shells like an oyster bed.

On the Eastern coast the winkle is known as the "ladle shell," from the fact that the fishermen, when calking their boats, use an empty winkle shell to run the tar into the seams in lieu of a ladle.

The flesh of the winkle is the toughest of all marine food that I have ever eaten, still there is a colony of colored people back of Keyport N. J., known as "Winkle Town," from the fact that its inhabitants live largely on winkles, whose shells line the road side in large heaps. In Europe the winkle is known as the pear-shell, from a supposed resemblance of outline to that of a pear.

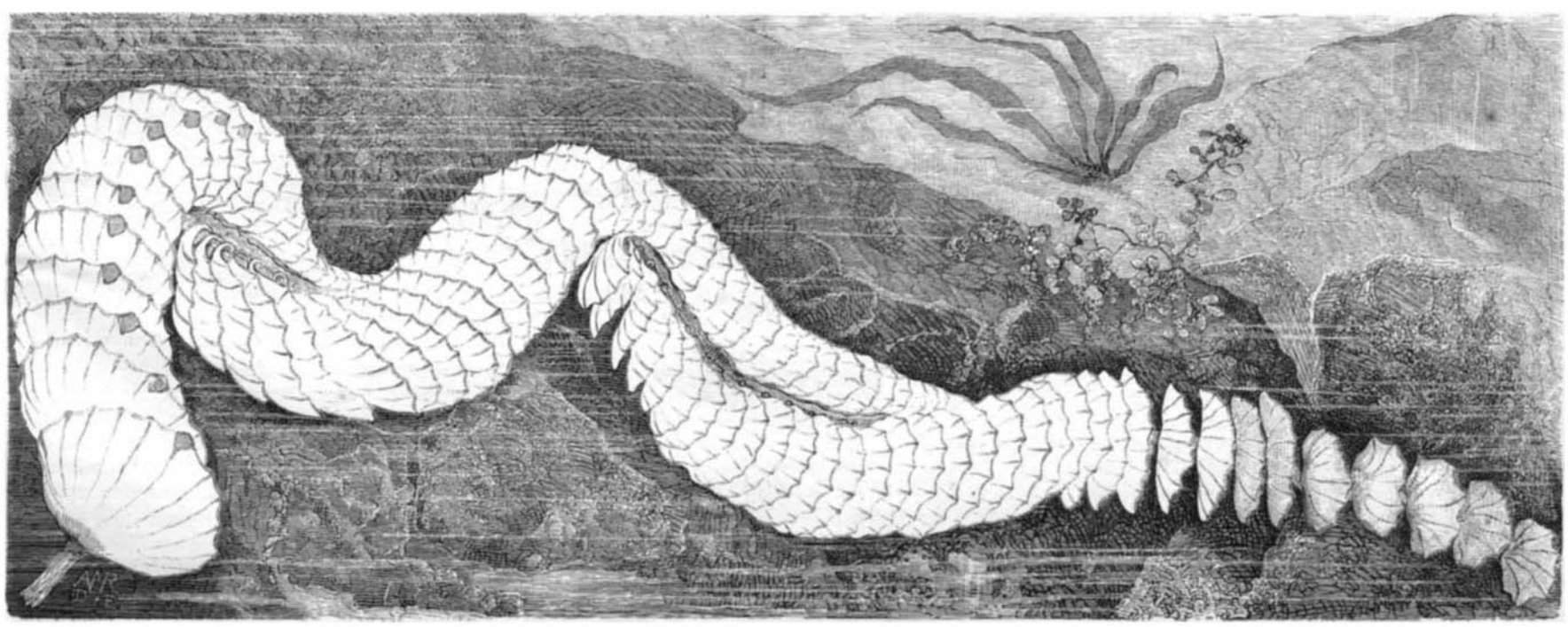
The winkle (*Sycotypus canaliculatus*, of Gill, and *Pyrula c.*, of De Kay) is one of the largest shells on the eastern coast of North America, sometimes measuring seven inches in length. It extends as far north as Cape Cod, and south as far as Mexico. It is found fossil in the post-Pliocene of Virginia, North and South Carolina, Pliocene of South Carolina, and Miocene of Maryland.

* During the summer season large quantities of winkle eggs come ashore on Coney Island, between Norton's Point and Brighton Beach.

Unappreciated Insects.

The *English Mechanic* reports a lecture on "Unappreciated Insects," delivered before the Chester Society of Natural Science, by the Rev. J. G. Wood.

With regard to the title of "Unappreciated Insects," it was a very wide one, said the lecturer, because he did not believe any insect was really appreciated. Appreciation depended almost entirely upon knowledge. Take, for example, the case of the silkworm. A savage who wears no clothes does not appreciate the silkworm at all, but looks upon it rather as a noxious insect because it destroys the mulberry tree, the fruit of which he wants for himself. The child saw a bee and grasped it, and the bee stung the child. The latter did not then appreciate the bee in any degree. But when the child came to know something about it, he learnt that the bee furnished the honey he liked so much, and accordingly began to appreciate it. So it was with the whole of the insect world; and he might state what he believed to be an absolute fact, that there was no insect, however insignificant it might appear, or however noxious we might seem to think it, which was not directly or indirectly a benefactor to mankind. He should choose one or two of these insects, which not only we do not appreciate, but which we fear or dislike, or even with the existence of which we are probably utterly ignorant. He would just mention an example of the mode in which insects benefit mankind. Insects were put into this world clearly for the purpose of preserving it and making it fit for creatures higher than themselves, and this they did by eating. It was clearly not likely that clothes moths were created for the purpose of destroying young ladies' jackets. What was it then they were created for? It must be remembered that the clothes-moth existed in countries where the ladies did not wear any clothes at all, and existed on the earth long before there were any young ladies at all. It must be created for something, and



EGG CAPSULES OF THE WINKLE.

keeping in view the object of insect life, he found a clew to one reason for the existence of the clothes-moth. The caterpillar of the clothes-moth, fed on wool, which is hair; and hair, by the ordinary agencies of nature, is imperishable. In the Egyptian Room of the British Museum might be seen a wig—a lady's wig--which is as brilliant and as fresh as when it came from the hands of its maker 3,000 years ago. Wool is hair, and hair is wool. The clothes-moth never touches cloth garments while they are in use, and never while the wool was on the back of the sheep that furnished the cloth, Every sheep sheds its wool once a year, scratching it against trees. If the wool were not removed from the trees it would kill the trees, for they would not be able to breathe. The clothes-moth and its insect allies set to work when the wool was done with, and enabled the trees to shoot and grow. It was a curious but a positive fact that if it were not for the clothes-moth and its allies there would not be a tree on the earth, and no human creature could exist on it. So the insect was intended to render the world better for beings higher than itself. His most excellent and respected friend, the cockroach, was not appreciated. People did not like it. He did not know why, for it could not sting or bite. Some people objected to it on the ground that it had a disagreeable smell. The insect was not aware of that fact. Then, probably, human beings had a disagreeable smell to animals. A deer could smell a person a mile off, and as the deer got away as quickly as it could, it evidently thought the person had a disagreeable smell. It was all a matter of taste. As to the cockroach it was often called a black beetle. It was not a beetle, and it was not black. Its color was a ruddy, chestnut brown, which was now becoming quite a fashionable color. They would notice there were two very distinct shapes of the cockroach. There were the male and the female, and there was no possibility of doubting which was which, for they followed the universal law that the male was twice as handsome as the female. It was a fiction of poetry to state the reverse. Cockroaches were always found where there was wasted food. They were never found where food was not wasted, and belonged more to civilized than to savage life. They were never found in the wigwam of the savage. He went on to observe that the cockroach was capable of being tamed. Its use was that of a scavenger. There was one particular use in which it was directly beneficial. Cockroaches were considered noxious insects, but there were others quite as noxious. They were quite as flat, but happily not so large. A person historically inclined might speak of them as "Norfolk Howards," while a musician might designate them as "B flats." The cockroach consumed these insects. The lecturer went on to treat of the earwig, the lace-wing fly, and the gnat, all of which he described and illustrated by sketches. Speaking of the gnat, he said it consumed in its life, in an aquatic state, certain animal and vegetable matter which, if not so consumed, would, with the warmth of the sun, produce gases productive of ague and asthma. The grand object of insect life was to eat, and render the earth fit for higher creatures to inhabit.

A Kentucky Robin Roost.

According to the *Times*, of Glasgow, Kentucky, there has been near that place the past month a robins' roost that equals the pigeon roost of olden times.

"A cedar thicket of about sixty acres furnishes the birds a lodging place About sundown every evening constant streams from every direction pour into the grove, and almost obscure the heavens in their flight. Night finds almost every bush in the thicket bending with its red-breasted load. For the past few weeks lovers of sport for miles around have visited the place, and every night the thicket is illuminated with the torches of men with clubs and sacks gathering the feathery harvest. Mr. Smith has killed over 2,000, and hundreds are carried away every night, but they don't seem to decrease; there are millions of them. Large quantities of them have been sold in town. They are very fat, and make, when well cooked, a dish good enough for anybody."

Seeing that the robin is one of our most efficient destroyers of insect pests – a young robin requiring daily a bulk of such food equal to its own weight – it is probable that every bird killed at the "roost" will cost the country a dollar, perhaps ten times as much. In any case one of these birds "in the bush" is worth a score or more "in the hand" or in the frying pan.

The Gold Gravels of California.

Mr. W. S. Keyes, mining engineer, reviews at great length, in the San Francisco *Bulletin*, the advance sheets of an important work on the "Auriferous Gravels of the Sierra Nevada." by Professor Whitney, formerly State Geologist of California:

The gravels of California are of economic importance, because of the gold which they contain, and because they are so situated that they can be washed with profit. They present phenomena almost identical with those of Australia, and have the advantage of the latter in being better supplied with water and dumping ground. Professor Whitney reviews cursorily the few localities of gold-bearing gravel of the coast ranges in the northwestern part of the State, and then proceeds to consider the gravel region proper. This extends from Mariposa to Plumas, and is very nearly coterminus with the limits of the gold-bearing slates. The hydraulic interest increases in importance as we go north from Tuolumne to Amador county, and reaches its culmination in El Dorado, Placer, Nevada, and Sierra counties. He shows that all the placers must have sprung from the degradation of pre-existing quartz veins, which were probably richer than those we now see. He devotes considerable space to a description of the various mechanical appliances used for saving the gold, and credits Ed. E. Matteson, of Stirling, Connecticut, with the invention of the hydraulic method. The physical conditions necessary for an economical washing of the gravels are particularly favorable along the western flank of the Sierra. Water with a sufficient head is plentiful, and there is a gradual and easy slope from the mountains for a distance of about 70 miles, with a grade of about 100 feet to the mile. This sloping plateau is cut by deep gorges or cañons through which flow the present rivers, and into them the vast accumulation of tailings is dumped. The great depth of erosion may be inferred from a single example, viz.: at Spanish Peak, where the Pliocene gravel beds occur 3,800 above American Valley. The gravels vary in thickness up to two or three hundred feet. Usually, but not always, the lowest portions are the richest. They are found in channels of varying width up to 4,000 feet. Upon the gravels in many localities we find a capping of basalt or volcanic ash. The thickness of this cap, other conditions being equal, determines the method of working, whether by "piping off" or by "drifting."

The fossils of the gravels are divided into three classes: Microscopic organisms, plants, and animal remains. Professor Whitney devotes considerable space to the specimens of human handiwork, mortars, pestles, etc., found in several localities, and relates in detail all the facts attainable touching the fossil human skull found in a deep shaft in the Calaveras gravel measures. He gives two lithographic views of the skull. The finding of this fossil—for fossil it undoubtedly is, because the phosphate of lime has been changed to carbonate—has aroused much controversy, but in view of the proofs adduced we are constrained to accept its genuineness. And in so doing we acknowledge the existence of mankind contemporarily with the depositions of the gravels. Professor Whitney is of the opinion that there was no river or system of rivers running parallel with the present crest of the range. He believes that the whole mass of the chain was originally much higher than it now is. He attributes the formation of the gravel beds to running streams which, during the tertiary age, carried far more water than the present rivers. He denies the possibility of their marine origin, or that they were due to glacial action.

Contemporaneously with and subsequently to their deposition great outpourings of lava and volcanic ashes took place, whereby large areas of the gold regions were covered up. Through these formations the present rivers have cut their way and have formed the deep gorges which we now see.

Discussing the complicated questions touching the economical working of the gravels Prof. Whitney gives an example where a yield of 2·6 cents per cubic yard barely covered expenses. He concludes, however, that under favorable circumstances, a yield of 4·75 cents per cubic yard may be considered the mean minimum necessary for profit. He shows that about 20 cubic feet of water is, on the average, required to move one cubic foot of gravel. He closes with the opinion that hydraulic mining will continue for very many years, unless the injury from the *débris* shall be too great to be endured. "And," he says, impressively, "there is no part of the world where scientific oversight and judicious legislative interference is more desirable for the future welfare of the community than in the Sierra Nevada of California."

The Mineral Belts of the Great West.

The *Tribune*, of Denver, Colorado, is anxious that a National Mining Exposition shall be organized at that place. In an article setting forth the advantages of such an exhibition, it says: "There have already been ascertained to be four well defined longitudinal belts of silver mines between the eastern base of the Rocky Mountains and the shores of the Pacific. First, the Colorado and New Mexico belt; second, the Utah and New Mexico belt; third, the Nevada and Arizona belt; and fourth, the California and Old Mexico belt. According to Professor Rossiter W. Raymond, this latter belt extends along the east base of the Sierra. There are many transverse sections all through the mountain regions, but these great belts of mineral are sufficiently well defined. The attention of the floating capital of the country is attracted to the districts traversed by these mineral deposits.

"Railroad lines are penetrating into and through the mountains. Colorado is already handsomely provided for, and the great Southwest will be gridironed at no distant day by lines already projected. With these transportation facilities Denver will become, if she is not already, the center of the great mining industry, and an exhibition of the ores of the royal metals alone. and appliances for mining them, would be warranted. But aside from these, there are coal fields in Gunnison county, New Mexico, and the Southwest, whose importance will not be long in attracting attention, and such minerals as antimony, gypsum, quicksilver, zinc, graphite, and even cinnabar, exist in our mountains. The mining of all these mineral substances is important, and their display would have a growing interest in this community. Even such coarse material as slate, limestone, and building stone of all kinds would command no small attention among practical men, while the various crystals and fossils and rare petrifactions would prove an attractive artistic feature to a general mineralogical exhibit."

Correspondence.

Hearing Noises in the Sun.

To the Editor of the Scientific American:

For a couple of months past there have appeared in all the papers accounts of certain efforts on the part of Professor Bell to reproduce, by means of the photophone, the noises which accompany the solar disturbances. But I have looked in vain for any statement of the error in the assumptions on which these experiments are founded.

If we have a beam of light of varying intensity falling on the selenium cell of the photophone, the instrument will give out sound; but it by no means follows that this sound is a reproduction of any previously existing sound.

Suppose the light of a lamp to be thrown on the cell, and a screen be made to pass rapidly back and forth across the path of the rays. The alternate light and darkness thus produced would certainly give a sound in the instrument, yet the lamp may burn and the screen may move absolutely without noise.

It is only when the variations in the light are originally produced by the action of the pulses in the sound medium that the sound given out will be a reproduction of a previous one.

Furthermore, the intensity and character of the sounds in the photophone depend upon the degree and rapidity of the variations in the light.

Now, in the case of the sun we have no assurance that the requisite conditions exist to enable us either to reproduce the solar noises, on a small scale, or to originally produce anything similar to them. We certainly cannot say that the variations in its light come from the rays having been modified by sound waves in the solar atmosphere; nor is there any reason to believe that they are at all naturally proportional to any accompanying sound; and until one or the other of these conditions is shown to be a fact, it seems to me that the results of Prof. Bell's experiments will continue to be, as hitherto, "not wholly satisfactory."

W. V. BROWN.

Cambridge, Mass., February 19, 1881.

Sun Storms.

It is pitiful to witness the condition of the sun. The great fire-ball is in intense commotion. His surface is seamed and scarred in every direction, with black spots that indicate the disturbing elements at work in his chaotic mass. Occasionally, for a day or two, the blemishes disappear, and the glorious king of day shows a face like a shield of glowing gold. But the aspect quickly changes; spots come rushing in all directions and assuming all forms. They appear singly and in pairs, and again in groups and rows. Immense groups break up into small ones, and small ones unite to form great chasms, into which half a dozen worlds might be dropped and there would still be room for more. Sometimes the spots are visible to the naked eye, and at that time a good opera glass or a spy glass will make them easily perceptible. Hundreds of observers all over the world watch the sun's face every clear day, and keep a record of the number of spots, their size, and the direction in which they move, for as the sun turns on his axis they turn with him, some of them remaining for months without much change, some taking on new forms and some disappearing entirely. Very little is known of this mysterious sun or the spots that are visible more than ninety millions of miles away.

Once in about eleven years the sun takes on his present sun-spot phase, and we are approaching the maximum of disturbance. No one knows the cause. Some believe that it is planetary attraction, some that it is the fall of great masses of meteoric matter, and some that it is the result of internal commotion and the rush upward of gaseous explosions in comparison with which our fiercest volcanic eruptions are but the flicker of a flame. Besides the sun-spot agitation, the gaseous outbursts are marked and vivid. The tongues of flame or rosy protuberances are darting forth in all directions and bearing their testimony to the solar commotion. Mr. Trouvelot, of Cambridge, who makes daily observation of the sun's chromosphere, gives a graphic description of a remarkable solar protuberance that he witnessed on the 16th of November. When first seen it was large and complicated, extending upward from the sun about a hundred thousand miles. Three or four hours after it had developed into huge proportions, extending far out into space, and vanishing gradually to regions where it could not be perceived. As nearly as it could be measured, it reached a height of over a quarter of the sun's diameter, or about two hundred and thirty-five thousand miles. Such a protuberance hurled upward from the earth would almost reach the moon! Two hours after, the whole structure had collapsed, and was only about eighteen thousand miles high. Observations like this give an idea of the mighty forces at work in the solar orb, and make observers long for the time when a satisfactory solution may be found for this mysterious periodical solar disturbance, so intimately connected with the meteorological condition of the earth.—*Providence Journal.*

THE Wheeler wood filler patents, after a long controversy, have been fully sustained at final hearing, and injunction is ordered to issue. This filler is manufactured by the Bridgeport Wood Finishing Company, of Bridgeport, Conn., and is acknowledged to be the best article in the market for the purpose. Mr. D. E. Breining, 40 Bleecker street, New York city, is agent.