ries of shelves about three eighths of an inch in thickness, and having their front edges recurved. The shelves above the bottom of the bottle are pressed backward against springs with which each shelf is supplied, so that when the bottle is removed they are again advanced uniformly. This arrangement gives a firm support to bottles of very different lengths.

The bottle being placed as described and as shown in the engraving, the hand grasping the lever is raised; this thrusts the spear into the cork and a reversed motion of the lever opens all the pivoted barbs in the position shown in detail at the left of the engraving, and draws the cork, breaking the wires etc., at the same time. Subsequent corks being drawn face the first up along the spear, until finally it is split by the conical end of the vertical shaft, and flies off out of the way.

Four motions, two with each hand, draw a cork in less time than the wire could be broken by the old method. By substituting a punch in place of the spear, and placing a small funnel to receive the cork, this machine can be used to cork bottles with great rapidity.

Patented through the Scientific American Agency, July 13, 1869, by Charles G. Wilson, of Brooklyn, N. Y., who may be addresed for the entire right at the Holske Machine Company's office, No. 528 Water Street, New York City.

FACTS CONCERNING THE SUN.

When we contemplate the benefits of the natural world, we do not often realize what a wonderful object is the sun, and how manifold are the kindly offices it constantly performs for us. From an inconceivable distance in space truly it rules the earth, imparting to it light, heat, and other subtile influences, and rendering it a possible abode for countless forms of life. The ancients were right in placing it foremost among the grand objects of creation, and we can hardly wonder that it was early chosen by idolatrous nations as an object of worship.

Of its size and distance the first astronomers had no true conception. Anaxagoras, who lived 430 years before Christ, claimed that it was as large as the whole territory of Greece, for which he was heartily laughed at. In later times, Leonard Digges, a quaint English philosopher of the sixteenth century, estimated its distance at 64,811½ miles, which is, in reality, barely a fourth of the distance to the moon! At the present day we smile at such guesses, knowing that the Grecian peninsula would, if laid on the sun, be absolutely invisible when looked at through our largest telescopes, and that, as regards the distance of the great orb of day, our friend Digges does not give us a thousandth part of the truth.

If we attempt to obtain a conception of the vast magnitude of the sun, we find ourselves thoroughly bewildered. Were we at its center, our moon would revolve in its orbit but little more than *half way to the sun's surface*. If it were a hollow sphere, there would be sufficient room to accommodate more than 1,200,000 balls the size of our planet. The earth is a mere homeopathic pill in comparison with such a body; and if projected on its bright disk, would, from our orbit, be absolutely invisible to the naked eye. Illustrations like these do little more than show that by no effort of the imagination can we obtain a satisfactory idea of the gigantic proportions of the nearest fixed star—our sun.

When viewed with a small telescope, care being taken to shield the eye with dark-colored glass, dusky spots are often detected on the solar disk. At the present time they may be seen with the veriest toy spy-glasses, and I have frequently so seen them when, without such modest assistance, they could not be detected.

As the next two or three years will be rich in sun-spots, our young readers will have ample time to try their hands in this department of astronomical science. Either a spy-glass, or opera-glass, will answer; and if colored glass is not at hand, an ordinary piece, smoked in a candle flame, will do very well. You must not, however, give up the search, if at first unsuccessful, for the curious blotches are constantly coming and going, and sometimes appear quite suddenly on the disk. They pass slowly across from the eastern to the western side in about fourteen days, not, however, owing to their own motion, but because of the sun's rotation. Should a group continue in existence so long, it would reappear on the eastern edge after the lapse of another two weeks, but this does not often happen. It is by means of observations of this kind, made through a long series of years, that the time of revolution of the sun upon its axis has been ascertained as twenty-seven and a quarter of our days.

Astronomers describe sun-spots as consisting of three distinct parts; the penumbra, or "almost-shadow," the umbra, and the nucleus. The penumbra consists of a grayish appearance, not unlike a dark cloud, which encircles the black center, like the fringe to a mat. It is the most conspicous portion of the phenomenon, and from its varying character possesses the chief interest. It is most frequently made up of long, thin wisps of cloudy matter, extending inward to the center of the spot.

The nucleus is but a darker part of the already deep brown, or black umbra. It is only seen under favorable circumstances; as when the telescope is a large one, and in good working order, the atmosphere clear and still, and the observer's vision acute.

One of the most interesting features of the sun's surface is the delicate mottling which may at almost any time be detected, if the atmosphere is moderately free from vibrations, and the telescope a good one. To see it satisfactorily, an instrument, in which the principal lens measures two or three inches across, is necessary. We may compare this mottling to the appearance of tissue paper held up to the light; or better still, to the tufted surface of light gray chinchilla cloth, such as is used for heavy winter overcoats. But best of all, we may liken it to the snow-white ends of coral branches.

The mottling of the sun would seem to vary considerably in appearance from time to time; sometimes resembling a sky covered with mackerel clouds, and then again presenting the compact and well-defined arrangement of the coral tips.

Let us consider for a moment what happens in the case of the union of the little black points alluded to. The bright envelope called the *photosphere*—which is what we see when we look at the sun—is evidently pierced in some unaccountable manner; and the rent growing larger and larger, a deep cavity in the luminous covering ensues, and the penumbra is formed. Should the cause of the phenomenon prove sufficiently violent, the true body of the sun is then seen through rifts in the cloudy strata. But instead of being white—dazzlingly so we should expect to find it—it has a dark brown tint. This is, however, an effect of contrast, just as coal fires look dull in sunlight, and the calcium light positively black, if placed between our eyes and the sun. The central mass supplies the materials for the illumination, but is not as bright as the dazzling light it produces, any more than in the case of a candle, the intensely hot and luminous gases enveloping the glowing wick, give out light equal to the upper portion of the flame, where combustion is perfect. Thus a sun-spot is by some considered as a tearing aside of the long flames issuing from the liquid or gaseous sea beneath, revealing the less brilliant lower strata of flame (to our view the penumbra), and the still less luminous body of the sun itself, the latter appearing as the umbra, with or without a nucleus, as the case may be.

The materials of our sun are, doubtless, capable of producing greater heat, pound for pound, than the substances usually employed by us for the same purpose. Recent researches in chemistry would seem to point to a more elementary condition of matter in the stars and nebulæ, than any with which we are acquainted on the earth. Who can say but that the production of our terrestrial elements was accompanied by displays of light and heat similar in intensity to those now witnessed in the sun and stars. This theory has great support in the constantly accumulating facts which the spectroscope is bringing to our attention.

One of the most impressive sights which ever falls to the lot of man to witness, is that of a *total* eclipse of the sun. Such an event is comparatively rare for any one part of the earth's surface, so that one may live to a good old age, and die without having witnessed such a phenomenon. In London, for instance, there has been no total eclipse since the year 1715; and more than five and a half centuries had then elapsed since the previous one.

The characteristic features of such an occurrence are the following: The peculiar gloom which spreads itself, like a pall, over the landscape; the changing tints of the sky, black, orange, indigo, red, sickly yellow, and leaden hues appearing at one and the same time, in different portions of the heavens; the awful approach of the moon's shadow in the air; and lastly, the magnificent circle of light around the eclipsed sun, called the *corona*, which is compared to the "glory" around the head of a saint, in an old painting. We might add to these the rosy flames frequently seen issuing from the dark limb of the moon, but in reality connected with the solar atmosphere. These flames are often to be seen with the naked eye. During the past year they have been analyzed by the spectroscope, and found to be masses of self-luminous hydrogen. Finally, the larger planets, and some of the principal stars, are occasionally recognized by acute observers during the period of totality, as the gloomiest part of the eclipse is called.—*W. S. Gilman, Jr., in the Riverside Magazine.*

Purifying Water.

It is a well-known and generally observed fact that the water of rivers, canals, and some lakes is never quite clear. This turbidity, which often remains even after many days of quiet rest, is partly due to inorganic substances floating about in the water and suspended therein, but is far more frequently caused by matters of an organic nature too minutely divided and too small to be readily recognized, even by a powerful microscope. The researches of some of the members of this report have undeniably proved that, at least as far as the Netherland waters they submitted to research are concerned, this turbidity is due to extremely minutely divided clay, by the aid of which a great deal more of organic matter than could otherwise remain suspended is kept in such an extreme state of division as to pass through filters and not deposit, even after many days of rest. When, to such kinds of water, a solution of alum (from 1-50,000th to 1-100,000th of the bulk of the water) is added, it will be observed that after a longer or shorter lapse of time a flocculent precipitate is formed, which is either alumina or a basic sulphate thereof, which flocculent material takes up all the turbidity of the water, leaving that perfectly clear; the precipitate thus formed has been submitted to chemical tests, and it was found to contain a large quantity of organic matter, and to yield, on being heated with soda-lime, ammonia very largely.

Since the committee was instructed to ascertain and discover the means of improving the condition of the potable waters where it was required, this especially also applied to the towns and villages whose chief supply of water for domestic and drinking purposes depends upon that of the river Maas, along the banks of which, in the lower portion of its seaward course, the population is entirely dependent upon its water; which has been almost from time immemorial known to produce, in those not accustomed to its daily use, a diarrhea, which in certain individuals is accompanied by very unpleasant, if not always, therefore, dangerous symptoms.

The water of this river has been analyzed over and over again by many eminent scientific chemists, and has been submitted to microscopic research, but no trouble, nor anything science could, armed with its best weapons, bring to bear on this research, has ever revealed the precise cause of this peculiar property, which is not possessed by the water of the same river, nor also by that of the Rhine, higher up its course.

For curiosity's sake, we here quote the result of one of the most recent analyses of this water taken at flood tide at Rotterdam: Physical properties, very turbid, does not become clear on standing, is not rendered clear on addition of a few drops of hydrochloric acid; taste—not quite unpalatable; solid residue—dried at 120° C., yielded, for 1 liter, 0·195 grm., containing 0·055 of combustible matter; earthy salts 0·0975 grm., containing 0·048 sulphate of lime, chlorides of alkalies, 0·0233; ammonia, none; slight trace of nitrates; dry residue had a yellow color before ignition.

It is a highly important fact, and one of very general importance to learn, that Dr. J. W. Gunning, of Amsterdam, has found that the perchloride of iron added to this water (and the same applies to far more foul waters experimented upon) has the effect of rendering it perfectly wholesome and even agreeable for use. To one liter of water, 0·032 grm. of the dry salt just alluded to, and previously dissolved in pure water, are added, and, after well stirring the liquid, it is left quietly standing, to settle, for full thirty-six hours.

A series of very carefully made experiments has proved that no free hydrochloric acid (the quality thereof contained in the above-stated weight of perchloride of iron only amounts to 0·021 grm.) was left in the clarified and purified water, but in order to suit the application on the large scale, and to make assurance doubly sure, as regards any acid or perchloride being left undecomposed, or rather uncombined, with the organic and inorganic matter of the water, Dr. Gunning has advised that a small, but equivalent, quantity of crystallized carbonate of soda should be also added some hours previous to beginning to take the purified water for use. At Dr. Gunning's request, a scientific gentleman of high attainments, who happens to have an excellent opportunity, near Rotterdam, to try on the large scale this process, has submitted it to practical test, and a quantity of no less than about 240,000 liters of Maas water, taken at all times of the year, has been treated by this process, and thereby rendered perfectly fit for use, and consumed by various parties, has proved to have been entirely deprived of its property of causing diarrhea; moreover, the medical officer in charge of the crew of Her Majesty's corvette the *Lynx*, moored off Rotterdam, in the river, has applied this process to the water taken from the river, and found by experience that the thus purified water has even the good effect of restoring to health such of the crew as had been incautiously drinking the not previously purified Maas water. It is, when using this means of purifying bad water, of great importance to let the sediment quietly settle; it occupies about 4 per cent of the bulk of the water, which on the large scale will, for security's sake, be submitted to a filtration through fine well-cleansed sea-sand before being sent through the mains of the large waterworks intended to be established near Rotterdam for the supply of that town.

The quantity of crystallized carbonate of soda which is equivalent to 0·032 grm. of dry perchloride of iron is 0·085 grm.; both these quantities are the maximum required to render the Maas water perfectly pure, even at the time when it is most turbid; comparative experiments have conclusively proved that the application of this process is very superior to filtration of the water, even through animal charcoal. The result obtained with the Maas water having been so eminently successful, the committee has applied this method to the purifying of water otherwise non-drinkable, such as is met with in many of the smaller canals, brooks, and also pumps yielding surface water of bad quality in many parts of the kingdom, and the results obtained are such as to justify the order that this method of purifying must be applied by authority to a class of waters which, thus treated, become available for use. The precipitate formed by the addition of the perchloride of iron and carbonate of soda, both previously dissolved, has been proved, by accurate analysis, to contain a large quantity of organic matter, which, on being ignited with soda-lime, yielded ammonia very largely; analysis has also proved that, as regards the Maas water, the only addition to its inorganic constituents is that of one part of chloride of sodium, by weight, in 40,000 parts of water by the application of this process. Dr. Gunning has found that the effect of the perchloride is not so conspicuous with some well waters containing much carbolic acid; while, moreover, there may exist in some of these kinds of waters, either in quantity or quality, inorganic salts which delay or altogether impede the peculiar mode of flocculent precipitation observed with the aboved-named Maas and other waters to take place after addition of the iron salt.—*Chemical News.*

Forms of Saw-Teeth.

The rules for regulating the forms of saw-teeth must necessarily be arbitrary, as much depends upon the nature and quality of the wood, and the direction in which it has to be sawn. In cross-cutting, the object is to sever every fiber or thread, and as the material in this direction is almost non-elastic or unyielding, teeth of an acute and nearly lancet-shape must be employed, so that acting like a series of knives in rapid motion, they cut the threads asunder rapidly and sweetly, the saw-dust produced having a fine granular appearance. On the other hand, in ripping or cutting with the grain, the desideratum is to separate the texture, as it were and as in so doing the teeth do not meet with so much resistance and resilience from the filaments as in cross-cutting, they may be made much larger and coarser, thereby producing small shavings or chips, rather than saw-dust. The nature and quality of the material to be sawn has considerable bearing on the configuration of the teeth, which, following the general law of cutting tools, and agreeably to common usage, have to be more obtuse or acute according to the disposition of the substances opposed to them. Soft and pliable woods, such as pines, willow, alder, limes, etc., require the use of large teeth with acute points and considerable pitch, whereas hard woods, or those of a tougher and denser consistency, as oak, mahogany, rosewood, etc., necessitate the adoption of teeth of perpendicular pitch and diminished space. Yellow deal, pitch pine, larch, etc., are of so gummy and resinous a character, that the teeth require not only more set but the blades themselves have to be smeared with grease, to keep them cool and decrease the friction arising from the adherence of the resin during motion. Similar results are experienced in working soft woods; the teeth become choked by the damp consolidated saw-dust, and obstinately refuse to perform their duty without extra force.—*Worssam on Mechanical Saws.*

LIGHT.

The palace keeps out the light, and the sanctuary keeps out the light. If rich men build their houses on broad avenues instead of the narrow lanes, which were streets in the former ages, they are not any more ready to let in the light from these open spaces; the drawing-rooms on the boulevard are just as dark as the chambers in the alleys of Rome or Cairo. In quantity and quality of brightness, there is nothing to choose between a house on Fifth Avenue and the interior of a house in the Jew quarter of Frankfort during most hours of the day, and most days of the year. You see as little light upon the gay and flowered carpet as upon the smirched and dingy floor. If the windows are wide and numerous, they are effectually hindered from their proper service by double or triple folds of drapery hung behind them, curtains of red and brown, thick shades, or opaque shutters. But the chances are that some false model of the architect has lessened the number of the windows themselves. How many of our newest houses seem to copy those medieval castles of German and Italian cities, and show rare slits or loop holes in place of the many windows of the last age of Puritan building.

In church building this tendency to shut out light is carried to even worse excess. The narrow lines of aperture in the walls between the useless buttresses are plated with ground glass, or with that cheap imitation of the ancient painted glass which exhibits the faces of Apostles and the scenes of the Gospel story in tawdry ugliness, varying this libel upon art by signs which mean nothing to the worshipers. Instead of the cheerful light upon the faces and forms of living men, we have the painful postures of leaning and agonizing saints, which transmit the hues, but not the shades and softness of the rainbow.

Another method of shutting out the light from house and church, more respectable, but not less sure and injurious, is in excessive tree planting. Trees are good, but we may have too much of a good thing. Trees are good, but sunlight is better, and if we cannot have them both, we had best keep the light and dispense with the trees. Trees are good in their place, but their place is not in front of windows, or anywhere that they can stop the sun from entering the house. There is sanitary virtue in the resinous breath of a pine forest, yet it is suicidal folly which will environ a house with thick evergreens, whether in city or country, destroying so the landscape of the rooms and doubling the desolation of winter. Such delicate and swaying shade as the branches of an elm can throw to break the blaze of the summer sun is well enough, but the somber shade which is solid and unyielding, fixed for all seasons, and stubborn against the sun, is only evil before our windows. For eight months, at least, of the year, the sunlight should have no barrier of any kind to hinder its entrance to the house; and for the remaining months, it should have easy evasion of the light foliage. Trees are not ornamental when they hide the house, and they are not healthful when they darken it.

This exclusion of sunlight from house and church has, nevertheless, its confident pleas of defense. There are weak eyes which cannot bear the light, and they must be protected. There are precious carpets, and their colors must not be faded. There are draperies which the sun's rays will spoil, and fine furniture which will be ruined, if too much brightness be thrown upon it. In summer, heat goes with light, and only darkness will keep in the air a tolerable tone. Only a few can afford the luxury of a new upholstery for every year, and it is mortifying to see that tapestries just hung in their place are already antiquated. Light may be pleasant, but if it brings opthalmia, it nullifies its own work. The argument which would shut it out seems very practicable and unanswerable. Until some saving process for furniture and for sight shall be invented, we must be content to live in the shade.

The doctors are unanimous in urging the sanitary virtues of sunlight. On this point all the schools agree—homeopathic, Allopathic, Hydropathic—and all consent that the sun has a first rank as a "healing medium." No pills, no powders, no lotions, no fluids are so potent in their influences, so infallible in their "exhibition" as this imponderable ray, which is never spent. Galen, Hahnemann, and Priessnitz alike, assume that light is essential to the effect of their remedies. The medical theory that a sick chamber must be gloomy and dark has ceased to have favor in any method of practice. A first requisite in choosing a site for a hospital is that it shall be sunny. This is quite as important as that it shall be dry; and, indeed, if it is not sunny, it can not be dry. The perfect hospital will be that which shall have the sun on all sides all the day, if the light can be so twisted by any Irish genius—which shall let it fall on all the beds in all the wards. In our recent war, the unlucky patients who found themselves billeted on the shady side of the hospital wards, had the trial of knowing that their confinement would probably be doubled; a severe wound on the sunny side would heal more quickly than a slight wound on the shady side. Even with the best ventilation, the malaria would cling in the blood which had only a northern light to drive it out. One could note the contrast, in passing between the beds of the patients who were sitting or lying in the sun, with those who were condemned to the shade. This large experience of the hospitals in the war converted many who were skeptics about light as a healing agent, and who went into the service with the lingering prejudice that the sick should be kept dark as well as kept quiet. Actinic influence is now not a fancy to be laughed at, but a fact to be considered and used. Hereafter, curtains on sick beds will be not only superfluous but a positive nuisance, to be put aside with all speed.

The exact reason, and the exact way of this sanitary influence of sunlight are not yet fully understood, but the fact is acknowledged. It is an influence which works in all kinds of disease. Inflammatory diseases, nervous diseases, digestive troubles, are all cured by a full supply of the sun's rays. These rays assist other remedies, and are the substitute for many remedies. They work in the Allopathic way upon jaundice and bilious maladies, bringing light out of the darkness; and they work in the Homeopathic way upon pale, lymphatic disorders, changing the unhealthy pallor to the whiteness of health. The direct action of the sun upon the skin is, indeed, dreaded by many, and it is not probable that any protest of a journal of health will lessen the sale of French kid gloves, or drive veils out of use. A white hand and a fair cheek will still be preferred to the bronze and tan of a sun-browned skin. Some protection against the burning of the sun may be allowed. The best sanitary influence of the sunlight is not that of the hot ray directly upon the skin, but rather of the light in the air that is around the body, the light that envelops, rather than the light that impinges upon the frame. The sunny atmosphere, more than the battery of rays, forces the frame into vigor. Reflected sunlight, if we can have plenty of it, is even better than the direct sunlight. The diffused stream, more than the exuberant fountain, dispenses the blessing. It is enough if we are only in the light, and it is not necessary to be always "under the sun." By an arrangement of pivoted mirrors, such as the damsels of Amsterdam use to bring images of the street into their chambers, one may get the disk of the sun itself into the room; but there is no need of that, if the reflected light is allowed to enter freely. This light does not lose its virtue, though it may have been beaten back from wall or tower, and may have taken many paths on its capricious race from its orb in the sky. We may get all the good of the sunlight without being either burned or dazzled, without feeling too sharply the hot hand of the sun upon our head.

The health-giving influence of light is undoubtedly largely upon the mind. It makes us cheerful, hopeful, and buoyant Whether that cheerfulness comes from the quicker flow of the blood or any change in its globules, or whether it makes the blood flow more swiftly and so gives more strength is of no importance. This we know, that low spirits are not nourished by the sunlight. Happiness in the light is the congenial state, and melancholy is driven back.

We may condense into a few practical rules the substance of these rambling remarks. First, in building, or buying, or hiring a house, choose always a site where there is abundance of light. Avoid dark lanes, neighborhoods where there are high walls, or thick groves, or any obstruction which shuts out the sun. A cottage with three rooms and light in them, is better than a palace with thirty halls and chambers, where the light must be made by artificial aids.

Then, secondly, live in those rooms of the house in which the light has freest entrance, sit in them, eat in them, sleep in them. If any are to be shut up and kept for state occasions, or for the reception of rare visitors, let them be the darkest rooms of the house, the north and east rooms, rather than the south and west. Let the sunny rooms be those which are the most constantly used.

In the third place, have such finish of the house in walls, ceiling, furniture, drapery, decorations, as shall assist and multiply, not absorb and destroy the light. As far as possible, let the brightness that comes into the house be met and repeated by the brightness that stays in the house. Have colors in the furniture that will be brought out and not ruined by the light falling upon them.

In the fourth place, give the light plenty of room to come in at the windows. When a bay window is built, with its treble surface of glass, do not neutralize its excellent gift by a treble fold of damask, and so destroy its beauty and its use. It is bad when two bay windows on the same side of the house, hinder each other's freedom, like the Siamese twins with their fatal ligament. But it is worse when within the house the heavy folds of cushion make the projecting window a useless excrescence, "a wart and a wen," on the side of the house, as Emerson says of the man who has no place in his soul for the sense of God with him.

And perhaps we ought to add a fifth rule, to get as much sunlight as we can in the day by early rising. That constant phenomenon which kindles the rapture of so many makers of verses, but is rarely witnessed in the cities, the rising of the sun, should not be altogether taken for granted. The morning light is good light for health as well as for song. Gaslight destroys more eyes than sunlight, and the wear and tear of evening riot ruin more furniture than any bleaching of the sun through the windows. It is safe to say that at no season of the year should the quantity of artificial light which we use be greater than the quantity of natural light. In the dead of winter the sun ought still to be the first of the torch-bearers. When we have artificial light we ought to have enough of it; and the discovery of kerosene has been a boon to the race, in giving a new lightness to the night. But no amount of artificial light, whether of candles, or oils, or oil from the rock, or magnesium, or oxygen, or the electric current, can match or reach the bounty of that great ever-flowing reservoir in the heaven. What amazing folly, for men who have such large estate in lands and houses and stocks, to shut themselves all day in dark corners, and scheme and figure by gaslight how they may add to their stores! Wiser is the farmer, who sows and reaps under the open sky, than he whose wealth is gained by a light which warms only to lameness and premature old age. The gospel of light needs especially to be preached to those whose work is among warehouses and in the haunts of traffic.—*Herald of Health.*

Moss-Agate Hunting in the West.

A correspondent of the Cincinnati *Commercial* writes from Sherman, Black Hills, Wyoming Territory:

"Pretty nearly every visiter to these hills and the plains is an anxious and excited seeker after 'moss-agates'—a name applied to a species of silicious formation that has been wonderfully and beautifully figured and flowered through the united agencies of iron solutions penetrating it, and then, becoming exposed to the action of the air, going through a sun and wind-drying process after the waters of some river bed or lake had evaporated. Some of these moss-agates are very tastefully inlaid with exact imitations of pine trees, vines, cedar forests, hedges, trains of cars, stars, figures, and almost every imaginable drawing. The agates found along the line of the Union Pacific Railroad are of four different colors, partaking of the names of the places where found, as follows: The Cheyenne brown agate, Granger Water agate, Church Buttes light blue agate, and the Sweetwater cream agate. The two latter are the most valuable, and most delicately formed.

"The most extensive agate beds are found in the vicinity of Church Buttes and Granger, distant about eight hundred and eighty miles west of Omaha. These beds are about fifty yards wide and nearly one hundred yards long, being isolated from each other at a distance of from one to two miles. As you approach them you observe a large patch of smooth, black, round cobble stones, and between these lie, almost concealed, the different sized and shaped moss-agates, and, occasionally sparkling among them, a bright topaz, and brown and yellow streaked carnelian. The intrinsic value of the agate consists in its display of moss, the vine and cedar forest being the most prized for jewelry sets. In one hour s time I have gathered a half gallon, some of which are extremely pretty, and I know of no pleasure, either in hunting buffalo or catching trout, half so exciting and so full of glory as the finding of a choice agate. I have seen staid old men search in silence for a few minutes for a 'real shiner,' and when they came upon it pick it up suddenly, take off their hats, swing them in the air, jump up and shout aloud, like schoolboys that had just been let out for a two-weeks' vacation. The very novelty of finding precious stones among black rocks, far out on the plains, many miles from home or habitation, is a delight so pleasing and intoxicating that it takes a mighty nerve to resist the pressure of one's making a most stupendous fool of himself. Good agates are worth, as jewels, from three to five dollars apiece. As novelties they are invaluable."

Mineral Caoutchouc.

Recent communications from Adelaide, South Australia, says the *Chemical News*, have made known the discovery in the southern portion of the colony of a remarkable carboniferous substance, which hitherto has only been found in small quantity in the coal strata of Derbyshire (England). It is a mineral caoutchouc, so called from its general appearance and elasticity. In Australia it is found on the surface of the sandy soil, through which it would appear to exude from beneath, as, burnt off occasionally by the bush fires, it is again found after the winter season, occurring in quantity and of varying thickness. Analysis proves it to yield 82 per cent or more of a pure hydrocarbon oil; its value for the manufacture of gas there will be great, and it is also believed to be applicable to the making of certain dyes. The discovery is also important from its indication of the existence of oils or other carboniferous deposits. This material, known in mineralogy as elaterite, is also found in a coal pit at Montrelais, near Nantes, France, at Neufchâtel, and on the Island of Zante. According to the analysis of the late Professor Johnston, of Durham University, it is a hydrocarbon, containing from 83·7 to 85·5 per cent. of carbon, and from 12·5 to 13·28 per cent. of hydrogen. The variety found in Derbyshire (near Castleton) has a specific gravity varying between 0·9053 to 1·233; the substance is highly inflammable, its color blackish-brown, its luster resinous.

Antiquity of the Wheelbarrow.

M. Le Duc corrects an error that has prevailed in France with regard to the invention of this useful little vehicle. It has been attributed to M. Dupin, who it has been claimed devised it in 1669. M. Le Duc says he has found mention of them in the thirteenth, fourteenth, and fifteenth century MSS., and gives an illustration taken from a vignette of a manuscript of the thirteenth century, of a man propelling a wheelbarrow, the form of which differs but slightly from those now in use.