Time Notation.

In the decimal system of time proposed by Professor Loudon, the present day of twenty-four hours is divided into ten periods, so that each of the new hours would correspond to two hours and twenty-four minutes of our present divisions. The ten periods would be again divided into a hundred subdivisions, called minutes, if necessary, and each equivalent to about one and a half of our present minutes. The minutes, again, would be subdivided into 100 seconds, which will thus be seen to be almost the same as the existing second. The advantages of such a system, as given by those in favor of it, are the aboltion of the A.M. and P.M., as has already been accomplished by the system of continuous notation for the whole 24 hours, and the convenience arising from the adoption of a system based on the decimal scale, by which vulgar fractions are gotten rid of, and the use of symbols for the hour, minute, and second avoided. In addition—and this is the consideration particularly urged—the time in hours and minutes would be indicated immediately by the clock, whereas, by the present system, one must consult two hands, and calculate the number of minutes besides.

If the affairs of the world were just beginning, we should say that Prof. Loudon's system was a very good system; but under the weight of the traditions of several centuries, our conception of time is so hopelessly wrapped up in the old-fashioned divisions that we confess ourselves willing to still consult two hands, and even consent to multiply the reading of one of them by five.

PALMERS' STEAM CARRIAGE.

The small steam carriage which we figure herewith, and which was shown at the Antwerp Exposition, is intermediate between Messrs. Dion, Bouton & Trepardoux's steam phaeton and Mr. Peraux's steam tricycle. It is a sort of a road locomotive, that hauls a thirty-three pound carriage, mounted upon steel wheels, and having a seating capacity for two persons. The two side wheels of the tricycle are 4½ feet in diameter, and the front or steering one, 23½ inches.

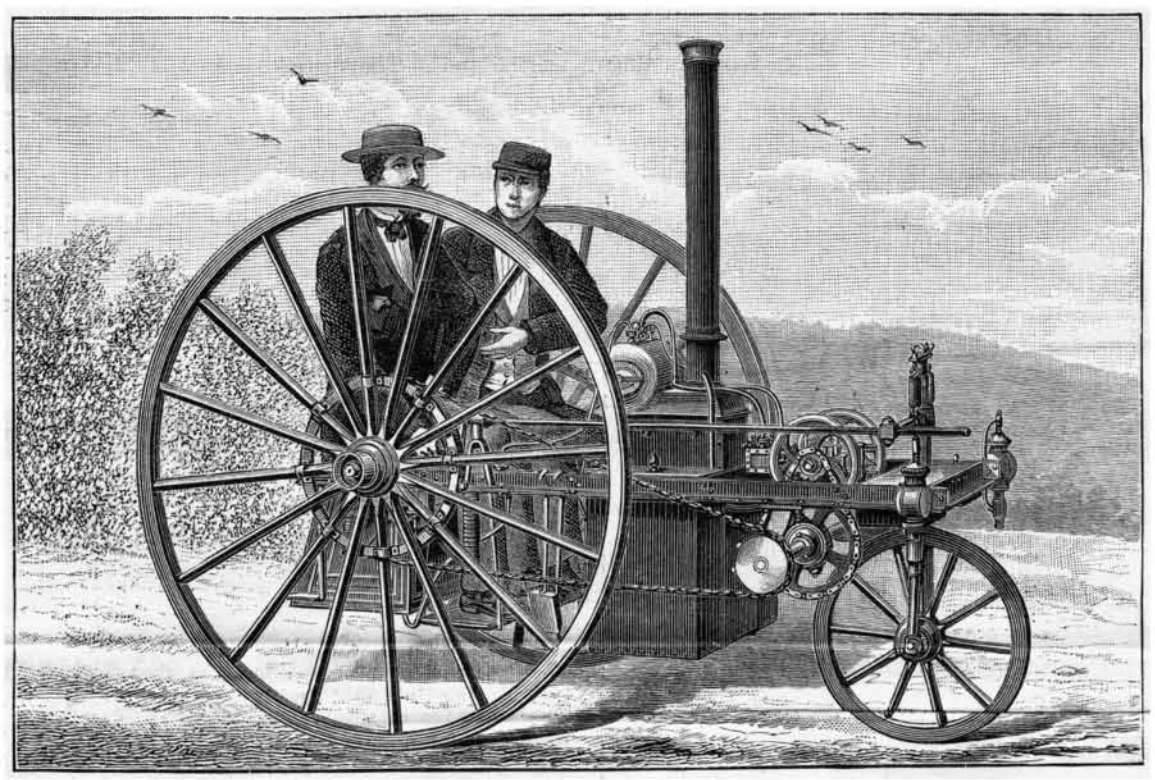
The boiler, which is heated with coke, is of the Temple variety, weighs but 175 pounds, and is of two-thirds horse power. It holds but a few pints of water, and is quickly put under pressure, and, seeing the small quantity of water submitted each instant to the action of heat, constitutes an inexplosive generator of nearly absolute safety. The steam produced actuates a small two-cylinder motor, 16 inches in length by 8 in width, the cylinders of which are 1½ inch in diameter. The stroke of the piston is 3 inches. In order to effect a saving in space and weight, transmission of motion to the shaft of the little engine is performed without connecting rods. To this effect, the piston rods are provided with vertical slots, in which the crank pins slide, as in the Rikkers motor. As the velocity of the motor is very great in proportion to that of the driving wheels, the initial speed is reduced to the proper ratio by an intermediate shaft. The motor is connected with this latter through a pitch chain, and the motion of the intermediate chain is transmitted to the driving wheels by two ordinary chains placed on each side, and at each extremity of the intermediate shaft. In consequence of their flexibility, these chains allow of very yielding springs being used.

The driver has within his reach all the apparatus necessary to keep up the fire, to set the engine running and to stop it, and to steer the vehicle.

The boiler is continuously fed by a pump situated to the left. On the right there is a minute injector, to be used in case of accident.

The fore wheel, which is the steering one, is actuated by a hand wheel and a screw that permits of giving it any direction. An ingenious device renders the vehicle proof against any shock that the steering wheel may receive, and thus insures of the directing of the vehicle, and renders the running of it more easy.

The speed of this carriage is from six to seven miles per hour.—*La Nature.*



PALMERS' STEAM CARRIAGE.

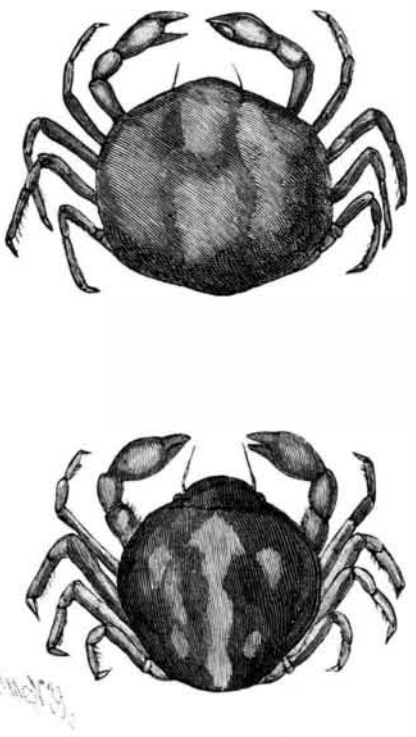
A COMPANY has been formed at Oil City for conveying natural gas from the wells to the cities and large towns in this and other States.

THE OYSTER CRAB.

BY C. FEW SEISS.

I find that the great majority of our people consider the little pink-tinted crab which is found within the shells of our oyster as merely the common crab of the markets in its immature or infant stage. This is an error, for the diminutive crustacean found within the oyster is not only a distinct species belonging to a different genus, but also a mature animal, fully grown. It is the oyster crab, or *Pinnotheres ostreum* of naturalists, and was first described by Thomas Say, in the *Journal* of the Academy of Natural Sciences, of Philadelphia, in 1817.

The oyster crab does not feed upon its host, the oyster, under whose roof it has seen fit to dwell, but upon such nutriment as it can get in the sea water that flows into the open shell of the oyster.



THE OYSTER CRAB.

The mollusk does not seem to be incommoded or to suffer in any way by having a lodger, for such are generally as fat and well-flavored as oysters that live alone. The oyster crab does not work its way into or injure the oyster, but lives only in the gill cavity or between the gills.

It is a rather singular fact that it is only the female crab that has been observed in oysters. Possibly the male may at times be found in a similar situation, but I have as yet failed to find an authenticated instance. The male is comparatively rare, and when seen is generally swimming near the surface of the water.

Various curious opinions have been expressed by writers as to whether these parasitic crabs are injurious or beneficial to their host. Referring to one inhabiting a large mollusk of the Mediterranean, an old writer says: The crab waits until a number of small animals upon which it feeds enter the shell, when he gives the mollusk a pinch, and it instantly closes the valves of its shell, and thus captures the animals, so that the crab can easily catch and devour them. Another one says, as the oyster is blind, and the crab has the power of vision, when the latter observes an enemy approaching he gives warning with his nippers, and the oyster, drawing its shells together, shields both itself and the crab from danger. These opinions, of course, must be taken as guesswork, and not as scientific facts. As I have said, the oyster of our coasts apparently does not suffer in harboring the lodger it has not the power to eject; but, nevertheless, the crab is certainly of no great benefit, and is an intruder and an uninvited guest all the same.

The female oyster crab is covered with a thin, semi-transparent, whitish shell, tinged in parts with pink. The pink color becomes orange after boiling. It measures across the shell or carapax seven-sixteenths of an inch to one-half of an inch.

The male is smaller, being only five-sixteenths of an inch in breadth. The upper surface of his shell is dark brown, with an irregular whitish band across the back, extending backward from above and between the eyes, and a white spot on each side of this band; sometimes, two additional small white spots posteriorly. The legs and under surface of the body are also of a whitish color. The shell of the male is more compact and hard than that of the female. The female of this species has been found inhabiting the oyster from the New England coast to South Carolina. The other species common on our coast is the spotted mussel crab (*Pinnotheres maculatus*), which lives in the shells of the common mussel (*Mytilus edulis*), but, so far as I can learn, has never been found in the oyster.

NATURAL HISTORY NOTES.

Uses of Spines in Cactuses.—Mr. Thomas Meehan considers that one of the uses of spines with which cactuses are covered is to break the full force of the sun on the plant. Plant lovers set out their treasures in summer under arbors of fish netting or galvanized wire, and those who have had experience would be surprised to find how the moving shadows of the twine or wire lower the temperature. A mass of spines on a cactus must certainly have the same effect. A cactus does not need much light on its epidermis to keep it healthy, and Mr. Meehan believes that one use of the spines is to furnish the required partial shade.

Longevity of Ants.—In the November number of the *Contemporary Review*, Sir John Lubbock says the general opinion used to be that ants lived for a single season, like wasps. "Aristotle long ago stated that queen bees live for six, and some even seven years. Bevan, however, observes that 'the notions of both ancients and moderns upon the subject have been purely conjectural. Indeed, it appears to be somewhat doubtful whether the length of life which the former seem to have attributed to individual bees was not meant to apply to the existence of each bee community.'

"The nests, however, which I have devised enable me to throw considerable light on this question. The queen ants are so easily distinguished from the workers that they can be at once identified, while, if a nest be taken in which there is no queen, we can satisfy ourselves as to the workers, because, though it is true that workers do sometimes lay eggs, those eggs invariably produce male ants. Hence, in such a case, the duration of the nest gives us the age of the workers; at least they cannot be younger, though of course they may be older. In this way I have kept workers of *Lasius niger* and *Formica fusca* for more than seven years. But, what is more remarkable still, I have now two queens of the latter species which I have kept ever since 1874, and which, as they were then full grown, must now be nearly twelve years old. They laid fertile eggs again this year—a fact the interest of which physiologists will recognize. Although a little stiff in the joints, and less active than they once were, they are still strong and well, and I hope I may still keep them in health for some time to come."

Red Snow.—At a recent meeting of the Biological Society of Washington, Mr. Romyn Hitchcock, of the National Museum, read a paper on red snow, and exhibited through the microscope specimens of the brilliant, minute crimson globules which give color to the snow, and about the character of which there has been considerable difference of opinion among naturalists. Mr. Hitchcock remarked that the red snow that at

tracted much attention from scientific gentlemen when it was brought home from the Arctic regions by Capt. Ross, in the year 1818, was by no means unknown before that time. De Saussure, as early as 1760, observed it on Mount Breven, in Switzerland, and since then many others have noticed it in the Alps and Pyrenees, and it seems to occur frequently in all parts of the world. Particular interest, however, was manifested in the material brought home by Capt. Ross, and several botanists secured specimens for examination, and, among these, Mr. Francis Bauer, who thought the plant a *Uredo*, and named it *U. nivalis*. Baron Wrangel regarded the plant as a lichen, and gave it the name of *Lepraria Kermesina.*

In the latest literature of algæ the plant is classified as *Chlamydococcus.* Until the method of propagation of this plant is more satisfactorily established, Mr. Hitchcock thinks it will be impossible to fix its systematic position. It is not improbable that in its actively vegetating condition the plant is green. This is indicated by the observations of early discoverers.

A specimen of the red snow collected by Dr. Kane, from the crimson cliffs of Beverley is in the National Museum, but is now thoroughly dry.

A specimen sent by Mr. Alexander McDougall was received in January of this year from Poverty Gulch, Col.

Mr. Hitchcock made a few observations on this and attempted to cultivate some of the cells, but without success. The cells were of a bright red color, sometimes apparently quite naked, but frequently inclosed singly or three or more together, in a colorless, shriveled envelope.

The contents of perfect and fresh cells appeared to be quite clear and transparent, with occasionally a well defined sort of vesicle of a deeper color than the rest. When the endochrome was pressed out from the cells into the surrounding water, it contracted into spherical, oil-like masses. The surrounding envelope was quite hard, tough, and resisting.

Floral Barometers.—The *Illustrite Garten Zeitung* says that the flowers of the well known spiderwort, *Tradescantia zebrina*, always open their flower buds twenty-four hours before rain comes. The plant is placed in a room where it receives the full rays of the sun. When the plant is in a flowering condition, buds follow each other rapidly, and it is very easy to note the facts as stated.

Nectar Secreting Plant Lice.—Prof. A. J. Cook says in *Science:* Oregon is the place for nectar secreting plant lice. During the past fall I received twigs of spruce and willow from that State which, though not more than six inches long, contained at least a tablespoonful of crystallized sugar, which was both pleasant and sweet. This insect is a species of Aphis, and though possibly not equal to the bee, or to the manufacturer of our best cane sugar, in her power to form an excellent article of sugar does surpass greatly the glucose factories in the quality of the product which she turns out.

Wonders of the Sea.

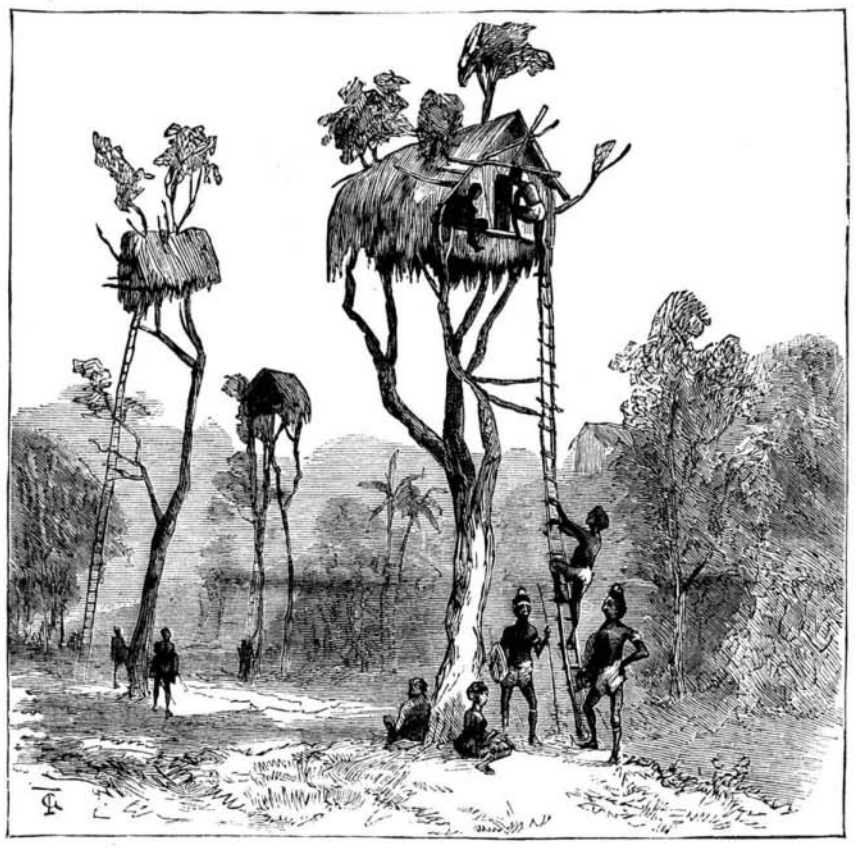
The sea occupies three-fifths of the surface of the earth. At the depth of about 3,500 feet, waves are not felt. The temperature is the same, varying only a trifle from the ice of the pole to the burning sun of the equator. A mile down, the water has a pressure of over a ton to the square inch. If a box six feet deep were filled with sea water and allowed to evaporate under the sun, there would be two inches of salt left on the bottom. Taking the average depth of the ocean to be three miles, there would be a layer of pure salt 230 feet thick on the bed of the Atlantic. The water is colder at the bottom than at the surface. In the many bays on the coast of Norway, the water often freezes at the bottom before it does above.

Waves are very deceptive. To look at them in a storm, one would think the water traveled. The water stays in the same place, but the motion goes on. Sometimes in storms these waves are forty feet high, and travel fifty miles an hour—more than twice as fast as the swiftest steamer. The distance from valley to valley is generally fifteen times the height, hence a wave five feet high will extend over seventy-five feet of water. The force of the sea dashing on Bell Rock is said to be seventeen tons for each square yard. Evaporation is a wonderful power in drawing the water from the sea. Every year a layer of the entire sea fourteen feet is taken up into the clouds. The winds bear their burden into the land, and the water comes down in rain upon the fields, to flow back at last through rivers. The depth of the sea presents an interesting problem. If the Atlantic were lowered 6,564 feet, the distance from shore to shore would be half as great, or 1,500 miles. If lowered a little more than three miles, say 19,680 feet, there would be a road of dry land from Newfoundland to Ireland. This is the plain on which the great Atlantic cables were laid. The Mediterranean is comparatively shallow. A drying up of 660 feet would leave three different seas, and Africa would be joined with Italy. The British Channel is more like a pond, which accounts for its choppy waves.

It has been found difficult to get correct soundings of the Atlantic. A midshipman of the navy overcame the difficulty, and shot weighing thirty pounds carries down the line. A hole is bored through the sinker, through which a rod of iron is passed, moving easily back and forth. In the end of the bar a cup is dug out, and the inside coated with lard. The bar is made fast to the line, and a sling holds the shot on. When the bar, which extends below the ball, touches the earth, the sling unhooks and the shot slide off. The lard in the end of the bar holds some of the sand, or whatever may be on the bottom, and a dropshutsover the cup to keep the water from washing the sand out. When the ground is reached, a shock is felt as if an electric current had passed through the line.—*Electrical Review.*

TREE HOUSES IN NEW GUINEA.

The great island of New Guinea is rather larger than the State of Texas, having an area of about 300,000 square miles. Its southern coast is within 150 miles of the northeasterly coast of Australia. This near contiguity to the southern continent has led to the feeling on the part of the Australians that New Guinea ought to be annexed to the British empire, especially as the French had attempted to seize Madagascar and the Germans were gobbling up other islands. The Australians became fearful, if the English did not occupy New Guinea, some of the other nations would do so. Accordingly, on the 30th of Oct., 1885, a military force was landed, the British flag hoisted, and the country duly annexed, the natives of course consenting. Our engraving shows some of the tree houses used by the New Guineans as places of safety and defense during wars or attacks of robbers. Each house holds a party of ten or twelve individuals.



TREE HOUSES IN NEW GUINEA.

RECENT DECISIONS RELATING TO PATENTS.

United States Circuit Court, District of New Jersey.

New York Belting and Packing Company *vs.* Allan Magowan *et al.*

By Nixon, D. J.

Letters Patent No. 86,296, for "Improved vulcanized rubber packing," were granted to the complainant corporation, as assignee of Dennis C. Gately, and this suit is brought to recover profits and damages for their infringement.

The answer of the defendants:

1. Denies infringement;

2. Alleges that Gately was not the original and first inventor of the thing patented; and

3. Claims that the letters patent are void—

(*a.*) Because the single claim is too broad, covering more than Gately invented. (*b.*) Because the specifications fail to distinguish between what was novel and what was old in the art. (*c.*) Because, in view of the state of the art at the date of the issue of the patent, no invention is exhibited and shown.

The defense of non-infringement was not well taken, not being sustained by the evidence. The packings manufactured by the defendant in 1882 and 1884 were exhibited. The first was an exact counterpart of the complainant's product, under its patent, and the second was a feeble attempt at evasion by having only the central part of the inner surface of the canvas next to the piston rod cut bias.

The other defenses, which may be fairly grouped under the single allegation of want of patentability of the invention in view of the state of the art, have caused more difficulty, and required more careful examination.

In the specification of the patent, the inventor states that his invention relates to packing of the kind for which letters patent were issued to Charles McBurney on June 28, 1859; that the defect of the McBurney invention was that the packing was not sufficiently elastic to maintain a tight joint between it and the piston rod, and that he has secured this greater elasticity by "forming the packing with a backing of pure vulcanized rubber, . . . which may be covered and protected by a strip of canvas or other suitable fabric." He claims that when a packing thus formed is placed in the stuffing box and around the piston, and the follower is screwed down so as to compress the packing, the rubber strip will also be compressed, and forced against the sides of the stuffing box; and as it cannot expand in the direction of the follower, it acts as a spring to hold the packing against the piston rod and to prevent leakage, compensating for any slight wear in the packing and making a tight joint between the rod and the packing. The claim of the patent is, "The combination with the packing such as herein specified of an elastic backing or cushion of vulcanized India rubber, substantially as and for the purpose set forth."

It is quite clear from these specifications that the patentee conceived that he had remedied the defects and made an improvement on the then existing McBurney patent. It was claimed by the inventor to be a durable substitute for the hempen packing before employed in stuffing boxes, more easily adjusted to produce a uniform pressure upon all sides of the piston rod, but in practical use it fell short of accomplishing what the patentee claimed for it. Frequent complaints came from the purchasers to the manufacturers that it was too stiff and rigid, and was not compressible enough to make a tight joint in the stuffing box. Gately, the patentee, who was the superintendent of the complainant corporation, set himself to the task of overcoming the defects. He made several experiments, and the result was the patent on which the suit is brought. He added to the McBurney packing the elastic backing or cushion of vulcanized India rubber, which not only rendered the whole more compact and more elastic, but, being compressed between the follower and the sides of the stuffing box, acted as a spring to hold the packing continuously against the piston rod, thus making a tight joint, which had not been attained under the McBurney invention, and was not shown to have been so well accomplished under any other patent.

Whether the thing devised is due to the genius of an inventor or to the mechanical skill of a workman is often a difficult question to determine. The line between them is not always clearly drawn. Invention indicates genius and the production of a new idea. Mechanical skill is applied to an idea and suggests how it may be modified and made more practical; and according to *Smith vs. Nichols*, 21 Wall., 112, such mere modification is not patentable unless some new and useful result is secured.

The complainant's patent is nearly on the line dividing invention from mechanical skill. But after carefully comparing it with the exhibits which are put in to show anticipation and its lack of patentability, I am of the opinion that the patent reveals invention; not so much because the packing is more elastic by reason of the addition of pure hard rubber, but because the patent discloses a new and better method of obtaining a tight joint between the packing and the piston rod than has been obtained by any other combination of elements, new or old.

It is a fact not to be overlooked, and has much weight, that the products manufactured under it went at once into such extensive public use as to almost supersede all packing made under other methods. Such a fact is pregnant evidence of its novelty, value, and usefulness, and accounts for the defendant's infringement.

Let a decree be entered in favor of the complainants and for an account.

AN American correspondent of the *Pharm. Centralh.* states that many manufacturers of carbolic acid prevent it from turning pink by adding a small quantity of phosphoric acid.