Ancient Ruins in Sonora, Mexico.

Ancient ruins have recently been discovered in Sonora, which, if reports are true, surpass anything of the kind yet found on this continent. The ruins are said to be about four leagues southeast of Magdalena. There is one pyramid which has a base of 1,350 feet, and rises to the height of 750 feet; there is a winding roadway from the bottom leading up on an easy grade to the top, wide enough for carriages to pass over, said to be twenty-three miles in length; the outer walls of the roadway are laid in solid masonry, huge blocks of granite in rubble work, and the circles are as uniform and the grade as regular as they could be made at this date by our best engineers. The wall is only occasionally exposed, being covered over with debris and earth, and in many places the sahuaro and other indigenous plants and trees have grown up, giving the pyramid the appearance of a mountain. To the east of the pyramid a short distance is a small mountain, about the same size, which rises about the same height, and if reports are true, it will prove more interesting to the archæologist than the pyramid.

There seems to be a heavy layer of species of gypsum about half way up the mountain, which is as white as snow, and may be cut into any conceivable shape, yet sufficiently hard to retain its shape after being cut. In this layer of stone a people of an unknown age have cut hundreds upon hundreds of rooms from 6 x 10 to 16 x 18 feet square. These rooms are cut out of the solid stone, and so even and true are the walls, floor, and ceilings to plumb and level as to defy variation. There are no windows in the rooms and but one entrance, which is always from the top. The rooms are about eight feet high from floor to ceiling; the stone is so white that it seems almost transparent, and the rooms are not at all dark.

On the walls of these rooms are numerous hieroglyphics, and representations of human forms with hands and feet of human beings cut in the stone in different places. But, strange to say, all the hands have five fingers and thumb, and the feet have six toes. Charcoal is found on the floors of many of the rooms, which would indicate that they built fires in their houses. Stone implements of every description are to be found in and about the rooms. The houses or rooms are one above the other to three or more stories high; but between each story there is a jog or recess the full width of the room below, so that they present the appearance of large steps leading up the mountain.

Who those people were, what age they lived in, must be answered, if answered at all, "by the wise men of the east." Some say they were ancestors of the Mayas, a race of Indians who still inhabit southern Sonora, who have blue eyes, fair skin, and light hair, and are said to be a moral, industrious, and frugal race of people, who have a written language and know something of mathematics.—*Chihuahua Enterprise.*

Metal Castings of Insects, Flowers, Etc.

One of our foreign exchanges gives the following mode for producing metallic castings of flowers, leaves, insects, etc.: The object, a dead beetle for example, is first arranged in a natural position, and the feet are connected with an oval rim of wax. It is then fixed in the center of a paper or wooden box by means of pieces of fine wire, so that it is perfectly free, and thicker wires are run from the sides of the box to the object, which subsequently serve to form air channels in the mould by their removal. A wooden stick tapering toward the bottom is placed upon the back of the insect to produce a runner for casting. The box is then filled up with a paste with three parts of plaster of Paris and one of brick dust, made up with a solution of alum and salammoniac. It is also well first to brush the object with this paste to prevent the formation of air bubbles. After the mould thus formed has set, the object is removed from the interior by first reducing it to ashes. It is, therefore, dried slowly, and finely heated gradually to a red heat and then allowed to cool slowly to prevent the formation of flaws or cracks. The ashes are removed by pouring mercury into the cold mould and shaking it thoroughly before pouring it out, and repeating this operation several times. The thicker wires are then drawn out, and the mould needs simply to be thoroughly heated before it is filled with metal, in order that the latter may flow in all portions of it. After it has become cold, it is softened and carefully broken away from the casting.

RINGED ADDERS CREEPING OUT FROM THE EGGS, IN THE BERLIN AQUARIUM.

About the middle of August a basket of serpents' eggs was sent to the Berlin Aquarium. They were found by some laborers in a heap of dirt, the old serpents having been killed under the impression that they were poisonous. There were about two hundred eggs adhering firmly together, forming a mass resembling the cocoons of the silkworm.

To the great joy and surprise of Dr. Hermes, the director of the Aquarium, who summoned numerous observers, the eggs began to show signs of life on the second day after being placed in the egg house. Twenty or thirty small serpents known as ringed adders (*Tropidonotus natrix*) broke through the leather-like shell, and after a few minutes crept quickly around the cage. These adders were 16 to 18 centimeters in length, and in color were exactly like their parents, having the well known yellow spot on the back part of the head. Some of the serpents showed at once their love for the water, gliding into the basin and showing great skill in swimming.

The hatching of the other serpents was quite remarkable. The high temperature of the room and the lack of moisture from the decaying earth dried the covering of the eggs, and made it very difficult for the young reptiles to make their longed for entrance into the world. They could only stretch out their heads, their bodies being firmly held by the parchment-like shell. Without assistance the young serpents would have perished. A large place was cut in the shell, and it could be plainly seen how the snakes, firmly twisted together, lay in their narrow prison. They stretched themselves out at once, so that a few minutes afterward none of them could have been forced back into the empty shells. The ringed adder is perfectly harmless, the crescent-shaped yellow spot distinguishing it from the poisonous adder, which has black zigzag lines on the back.—*Illustrirte Zeitung.*

RINGED ADDERS CREEPING OUT FROM THE EGGS, IN THE BERLIN AQUARIUM.

By going a few minutes sooner or later, by stopping to speak with a friend on the corner, by meeting this man or that, or by turning down this street instead of the other, we may let slip some impending evil, by which the whole current of our lives would have been changed. There is no possible solution to the dark enigma but the one word, "Providence."—*Longfellow.*

Varnish.

How many, in looking at a handsomely varnished surface, stop to think that the varnish has other uses than that of imparting a fine finish. Few, we imagine, give it a second thought, so accustomed are they to seeing the lustrous mirror-like surface of carriages and coaches; hence the curiosity which at first may have been excited, and the wonder as to how such results could be obtained, soon become dulled by everyday contact.

The degree of transparency or paleness is one of the means of determining the grade or quality of varnish. A fine sirup has much the appearance of a good varnish. The word varnish covers a very wide field, as the term in its fullest sense can embrace all the thousand and one preparations compounded for as many different purposes, but we shall refer only to one branch, that of varnishes for coach and car work, as it is here that the highest perfection is reached, and the greatest skill and intelligence are required in manufacturing.

Almost any encyclopedia will give the constituent parts of varnish, but the art of making good varnish is not found in type, and can only be learned by patient, painstaking effort and intelligence.

An essential quality of varnish is that it must harden without losing its transparency, as it must not change the colors it is intended to preserve. It must exclude the action of air, because wood and metals are varnished to protect them from rust and decay. It must also be waterproof, else the effect of the varnish would not be permanent. And a point of primary importance is that it must possess durability.

In combining its various ingredients so that the varnish will answer these requirements, and at the same time work freely under the brush, lies the secret and mystery of varnish making, and he who best succeeds in accomplishing it confers upon the world a blessing and upon himself a fortune.

Let us look at a carriage and observe the brilliant surface—smooth as a mirror, and like it, reflecting one's features, though possibly somewhat distorted by a concave or convex panel, as the case may be. The luster appears to have considerable depth, yet we know that it is but slightly removed from the bare wood. Would you suppose that fifteen or sixteen separate coats had been put on to attain this, beginning with the priming or first coat, and following it with various layers, each successive coat suited for its special purpose in this outgrowing process? All must be perfect, else the finished job will suffer, for one coat cannot remedy the defects of another.

New uses are constantly being found for varnish, by which it embellishes the article to which it is applied, affording satisfaction to the buyer and profit to the manufacturer. For it is a truism, that whatever adds to the appearance, whether on animate or inanimate nature, whether the addition comes from "a grace snatched beyond the rules of art" or otherwise, increases the pleasing power of the one and the selling power of the other in a corresponding degree. Art, which in one sense is synonymous with excellence, is entering more and more into the various mechanical pursuits, and the future will reveal a more decided advance than has yet been accomplished.—*Charles Howard, in Western Carriage Journal.*

Boride of Aluminum.

Joly obtained a boride of aluminum, BoAl, in hexagonal golden plates by reducing boracic acid with aluminum in graphite crucibles. These crystals were studied before by Deville and Wohler, being known as boron diamonds. Hampe has taken up their study again. He also obtained Bo_4Al as large black lamellar crystals; also yellow quadratic crystals with brilliant luster inclosing carbon and aluminum. Fourthly, he obtained one or more compounds of boron and carbon, which have not yet been investigated.

Digestibility of Raw and Cooked Meats and Milk.

E. Jessen has recently completed some interesting investigations regarding the time required to digest meat and milk prepared in different ways.

His first experiments were made with artificial gastric juice. Twenty-five grammes of beef were placed in it for 24 hours, and the undissolved portion weighed at the end of that time. Of the raw beef about 5½ grammes only remained, of the half cooked 9½ to 9¾ grammes, while that which was well done left from 17 to 18 grammes.

The next experiments were made on a dog with an opening in the stomach. Here too the raw meat digested more quickly than boiled or roasted meat. The time for raw beef was 5·3 to 5·5 hours.

Experiments were also made upon men by introducing 100 grammes of meat and 300 c. c. of water into an empty stomach; after a certain time the contents of the stomach were pumped out, and if the microscope detected no muscle fibers the digestion was considered finished. The time required was as follows:

Raw beef, shaved fine	2 hours.
Half done boiled beef, shaved fine	2½ "
Well done " " " "	3 "
Half done roasted, shaved fine	3 "
Well done " " "	4 "
Raw mutton	2 "
" veal	2½ "
" pork	3 "

In the experiments with milk such a quantity was given as to correspond in the quantity of nitrogen it contained to 100 grammes of beef. The time was as follows:

602 c. c. raw cow's milk	3½ hours.
602 c. c. boiled cow's milk	4 "
602 c. c. sour " "	3 "
675 c. c. skimmed cow's milk	3½ "
656 c. c. raw goat's milk	3½ "

—*Zeitschrift fur Biologie.*

New Source of Caoutchouc.

The attention of the Indian Government has been drawn to a new plant, which is common in southern India, and yields abundant supplies of pure caoutchouc. It is an apocynaceous plant called *Pramera glandulifera*, the native habitat of which appears to be in the forests of Cochin China, where the liquid juice is often employed in medicine by the Annamites and Cambodians. In China it is called *tuchung*, and is a frequent ingredient in the Chinese *materia medica*, in the shape of blackened fragments of bark and small pieces of twigs. It is imported into that country from Cochin China, the price of the bark after being smoke dried being about 20s. the picul (133 pounds). When broken, the twigs are seen to contain an abundance of caoutchouc, which can be drawn out into threads as in the East African landolphias. The plant may be propagated by cuttings, and M. Pierre, director of the Botanic Gardens at Saigon, thinks that it may be planted in forest reserves when the trees are not less than ten years old, and that an addition may be made to Indian forestry of great economic value.

ADJUSTABLE PIPE WRENCH.

On the working end of the handle is a thread, cut preferably between the V and square thread—a little flat at both the top and bottom—thus doing away with the sharp edges of one and the square corners of the other, and producing a thread not so susceptible to injury from rough usage. On the screw threaded portion of the handle is a nut, attached to the sides of which, by forks, is an angular serrated jaw, the teeth of which extend to the second angle from the end. On the extremity of the handle is a reversible fixed head having opposite concave serrated gripping surfaces. The forked portion of the jaw is of diverging construction toward the nut to which it is pivoted, thereby insuring increased strength. The reversible form of the head or fixed jaw gives a more varied gripping surface, and consequently reduces wear; and as the serrated surfaces of the head are concave in direction of the length of the head, the hold or grip is better than if obtained from a convex form. The nut is long, and has two of its opposite sides flattened to form bearings for the forked end of the swinging jaw. This method of construction produces a cheap, simple, and durable wrench having an easy and extensive adjustment. Its form and application will be readily understood from the engravings. The wrench will work equally well on round, square, flat, or any number of sides, and can be made in sizes to suit the requirements; and when made of steel, as contemplated by the inventor, will be strong and light. If desirable, the opposite serrated sides of the fixed jaw may be at different angles to suit varied kinds of work, and, if deemed essential, the swinging jaw may be made with a rib along its back to insure greater strength, and may also be made of a concave instead of an angular form.

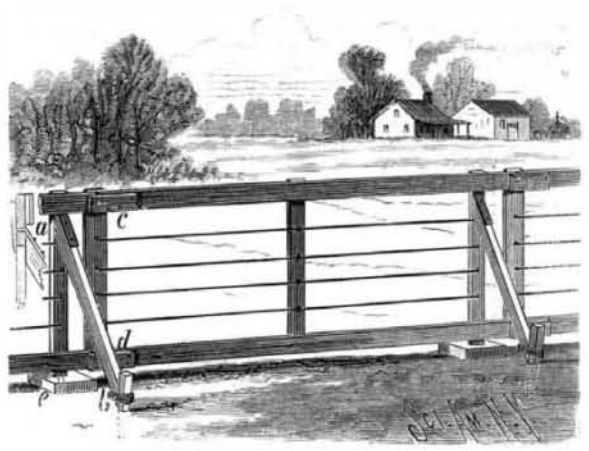
This invention has been patented by Mr. James L. Taylor, of Ishpeming, Mich., who will furnish further information.

A Rainbow in a Clear Sky.

At Waterbury, Conn., about half-past eleven o'clock in the morning of October 30, while the sky overhead was clear and blue and the sun shone down with a warm and genial smile, there suddenly appeared in the northern heavens a rainbow of wondrous beauty and brilliancy. For about five minutes throngs of people gathered upon the sidewalks and other convenient places to observe the phenomenon, which then gradually faded away.

PATENT FENCE.

The fence shown in the accompanying engraving is constructed in sections or panels of a convenient length for handling, and consists of top and bottom rails, end posts, and one or more intermediate parts. For intermediate rails, wood or metal bars are used, but rods or wires, secured to the uprights by staples, are preferable. In order that the panels may be easily joined, the upper and lower rails of one panel are extended so as to lap upon the edge of the post of the adjoining panel. The end post of one section is secured by a dowel pin to a ground block, *e*. The panel thus supported is the one having the projecting rails. The joint of the upper rails is so made that the panel whose rails do not project will rest upon the other. Cleats, *c*, are fixed to the sides of the rails to keep the panels in line. The fence brace is beveled at both ends, and has at its top the lock plate,



RIGG'S IMPROVED FENCE.

shown at *a*, which is bent at right angles to the bevel and passes through an aperture in the post, projecting from the other side sufficiently to receive a locking key. At the foot of the brace is secured, by a suitable pin, the yoke plate through which the stake is driven firmly into the ground. This stake is made wedge-form, so as to tighten against the beveled end of the brace and yoke in a manner to prevent any rise of the foot of the brace.

This invention has been patented by Mr. James W. Rigg, of Mount Carmel, Illinois.

Nordenskjold's Greenland Exploration.

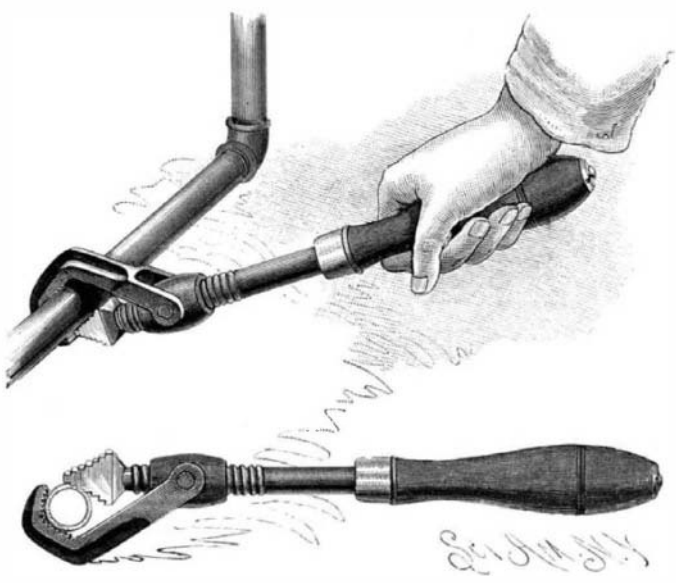
Baron Nordenskjöld has telegraphed to us, from Thurso, the results of his Greenland expedition. His work has not been wasted. It shows us, for the first time, what the interior of Greenland is like, and though it is very unlike what Baron Nordenskjöld imagined it to be, it has furnished him with evidence in favor of his theory that the volume of the globe has been increased by the cosmic dust that has been constantly falling upon it from the lucid interspace that surrounds it on all sides.

Greenland, Baron Nordenskjöld held, must have reason for the name it bears. It could not be the mere waste of ice which it has been supposed to be. The coast line, it is true, is forbidding enough, and gives slender promise of anything better beyond. But as long as the interior was unvisited there was ample room for hope. The moist ocean winds which blow upon Greenland could be assumed to have spent their force and to have deposited their burden of snow upon the high mountains of the coast. Further inland the scene might be expected to change, and to reveal verdant oases, covered with vegetation, with grass and shrubs and flowers cut off for long ages past from intercourse with the outer world, and possessing, therefore, peculiarities of their own, fit objects of study to the scientific naturalist. Such were Baron Nordenskjöld's anticipations. His report tells us nothing in confirmation of them.

His expedition to the interior has penetrated a long way into regions never before traversed. It has found mountains, it has found snow, it has found ice, and it has found cosmic dust, but it has not found the oases of which it was in search. The main body of the party were stopped short at a comparatively early point. They started, on the 4th of July, from the west side of Greenland and made their way inland for 140 kilometers, reaching a height of 5,000 feet. Here the soft snow rendered it impossible for their sledges to proceed. The Laplanders who had accompanied them were then sent forward on foot with snow shoes, and made their way for another 230 kilometers in advance of the rest. The ground rose as they went, but the state of things remained otherwise substantially the same. There were higher mountains and more snow and ice, but no verdant plateau, and no sign whatever to give them hope that they were on their road to it. As for the cosmic dust, there seems to have been no need of keeping the intended keen look-out for it. There was dust everywhere, whether of cosmic origin or not, but curiously placed at any rate, and demanding to have its presence accounted for. Thus far, then, although Baron Nordenskjöld has not been successful in forcing a passage from one side of Greenland to the other, and although he has seen and heard nothing of the warm fertile interior he expected to find, he can claim at least to have discovered something of the nature of an ice-covered continent, and to have shown the way to future discoverers who may be led to follow in his footsteps, and who may not impossibly outstrip him.

While this visit to the interior of Greenland was in progress, the rest of the expedition were exploring the northwest coast. Their results have been neither few nor unimportant. They have come back with rich collections of zoological, botanical, and geological specimens. Their report of the region is favorable for future visitors. The glaciers in the neighborhood are few and not great; the fiords are free from ice and likely, as a rule, to be accessible for suitable vessels during the summer months of the year. The expected cold current along the coast has been found to exist, but it is pronounced to be insignificant. In their subsequent visit to the east coast of Greenland, Baron Nordenskjöld and his companions have been forestalled by earlier visitants, for they have found traces of Norman remains some centuries old but from the fifteenth century to the present year there have, Baron Nordenskjöld declares, been no ships anchored there but his own. In such circumstances the title of discoverer may fairly be considered to have lapsed, and to belong by right to the latest claimants, to Baron Nordenskjöld and his companions.

Such is the summary which Baron Nordenskjöld sends us of the results he has attained. He has struck out a new line and has added a chapter different from all the rest to the records of Arctic exploration. His work for this year is at an end, but it is not likely that he will be content with what he has done. It has not been his first voyage of exploration to Greenland, and we do not suppose it will be his last. The passage across Greenland remains still unaccomplished; possibly the mirage of the green lands of the interior remains still floating before Baron Nordenskjöld's eyes, and tempting him onward to test the reality of the vision.—*London Times.*



TAYLOR'S ADJUSTABLE PIPE WRENCH.

A Proposed New Pipe Line.

A number of Philadelphia and Boston capitalists have formed an organization which has in view the laying of a pipe line from the new salt wells in Western New York to some point in the Lehigh coal region. The consumption of coal in the evaporation of brine at the wells is very considerable, and the projectors of the pipe line aver that the waste coal, or culm, that has accumulated in the coal regions, and cannot be utilized by any industry there, could be used to advantage in the evaporation of brine. Experienced salt men say that the brine running through the pipes would be thick with iron rust when it reached the works, and, unless some chemical action could be brought to bear on it to purify it, would be worthless.—*Iron Age.*

It is not true that the passage of salt water through cast iron pipes would so far disintegrate the iron as to cause a discoloration of the water. Pipes of cast iron speedily take up the depositions of the water going through them, and do not make saline deposits when there is a current, and other deposits, alkaline or of ordinary minerals, are made only in a sluggish current. The use of salt water pipes on shipboard for exhaust steam and for pumps show the folly of this objection to the pipe line, in consequence of the erosion of the pipe because the water is salt.

Standard of Education.

According to Ruskin, an educated man ought to know these things: First, where he is—that is to say, what sort of a world he has got into; how large it is, what kind of creatures live in it, and how; what it is made of, and what may be made of it. Secondly, where he is going—that is to say, what chances or reports there are of any other world besides this; what seems to be the nature of that other world. Thirdly, what he had best do under the circumstances—that is to say, what kind of faculties he possesses; what are the present state and wants of mankind; what is his place in society; and what are the readiest means in his power of attaining happiness and diffusing it. The man who knows these things, and who has his will so subdued in the learning of them, that he is ready to do what he knows he ought, is an *educated* man; and the man who knows them not is uneducated, though he could talk all the tongues of *Babel.*