THE RED CLOUD CHIEF

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A. C. HOSMER - - Proprietor

DIAMONDS FOR DRILLS.

An Explanation of the Apparatus by Which Deep Rock Boring is Accomplished.

"Diamonds are comparatively cheap nowadays," a rock-drill manufacturer said to a New York *Sun* reporter, "and the diamond-set bits used in the diamond drills do not cost as much as they did."

"Are genuine diamonds used in these drills, or are they called diamond drills because the steel has an extremely hard temper?" the reporter asked.

"Diamonds are used in the drills. They are chiefly one and two carat stones. At present they cost about $20 a carat. They are in the rough. The diamond-set bit is hollow. It is a steel thimble, having three rows of diamonds imbedded in it, so that the edges in one row project from its face, while the edges of those in the other two rows project from the outer and inner periphery respectively. The diamonds of the mid-mentioned row cut the path of the drill in its forward progress, while those on the outer and inner periphery of the tool enlarge the cavity."

"How are the diamonds set in the bit?"

"The bit is of soft steel, in which holes are drilled. After the diamonds are fitted the metal is hammered against them so that they remain firm."

"Do the diamonds wear out?"

"Their edges which come in contact with the rock get a little smooth, and then they are taken out and reset, so that a fresh edge is presented."

"Have all the hollow drills three rows of diamonds?"

"No. Some have only one row, but these are not very large. The diamonds stand out from the steel setting, so that the steel does not come in contact with the rock."

"How are the diamond drills worked?"

"By a rapid rotation varying anywhere from 400 to 1,000 revolutions a minute. There are different machines used for different kinds of drilling. For deep boring a machine with a double oscillating cylinder engine is used mounted on an upright or horizontal tubular boiler. The machine has a screw shaft made of heavy hydraulic tubing from five to seven feet in length, with a deep screw cut in the outside. The shaft also carries a spline, by which it is feathered to a lower sleeve gear. This gear is double, and connects by its upper teeth with a beveled driving gear, and by its lower teeth with a release gear, which is a friction gear, and is fitted to the lower end of the feed shaft, to the top of which a gear is feathered, fitting to the upper gear of the screw shaft, which has one or more teeth less than the upper gear on the feed shaft, whereby a differential feed is produced. This friction gear is attached to the bottom of the feed shaft by a friction nut, producing a combined differential and fractional feed, which renders the drill perfectly sensitive to the character of the work through which it is passing, and maintaining a uniform pressure. The drill rod, made of heavy lapweld tubing, passes through the screw shaft and is held firm by a chuck at the bottom of the screw shaft. To the lower end of this tubular boring-rod the bit is screwed, and to the upper is a watch swivel, to which connection is made with a steam-pump. You can see by this that the machine is very simple and not likely to get out of order."

The reporter fell into a chair. When he came to, the drill man was saying:

"The screw shaft, being rotated and fed forward, rotates the drill rod and bit, cutting an annular channel——"

"Where do you get thed damonds for your bits?" the reporter asked in desperation.

"They come princinally from Brazil. Some come from Siberia and some from the south of Africa; the latter, however, are more glassy and are not so tough as the Brazilian diamonds, and much more likely to crush under pressure."

Tattooing Among Alaska Indians.

A man who had passed much time in trapping and hunting in Alaska says: Although the Yukon Indians have abandoned many of their old customs, under the teaching of occasional missionaries, all of them still keep to the queer habit of tattooing. The way they do this is different from any I ever saw or heard of. Instead of pricking the stuff in with sharpened bones or needles, they make a paste out of charcoal and grease, soak a thread in it, punch a needle through the flesh so that it comes out at a different hole from the one where it entered, and then draw the thread through under the skin. The operation is painful, for the flesh swells up and looks very much inflamed. Men tattoo only their hands and wrists with the pictures of the nobler animals or fish, but the women tattoo their faces also. These latter begin the process when they are quite young, making birds, turtles, or some other insignificant things on their hands and wrists, while they draw lines of different kinds on their chins and the lower part of their cheeks. As a rule, this tattooing is done entirely in blue, but now and then there is an Indian who has dotted red spots through the blue.

Josh Billings is worth over $15,000. Petroleum V. Nasby is worth $200,000. Mark Twain is the richest humorist in America. Robert J. Burdette has made nearly $20,000. Charles Lewis, the "M. Quad" of the Detroit, *Free Press*, receives $10,000 a year.

The Transmutation of Metals.

The Arabians no doubt derive their ideas of the transmutation of metals into gold and the belief in immunity from death by the use of the philosopher's stone from China. Among all the metals with which the alchemist worked, mercury was pre-eminent, and this is stated to be the philosopher's stone, of which Geber, Rasis and others spoke in the times of the early caliphs. In China it was employed extensively as a medicine. On nights when dew was falling, sufficient was collected to mix with the powder of cinnabar, and this was taken until it led to a serious disturbance of the bodily functions. In the ninth century an emperor, and in the tenth century a prime minister died from the effects of an overdose of mercury. Chinese medical books say it takes 200 years to produce cinnabar; in 300 years it becomes lead; in 500 years more it becomes silver, and then by obtaining a transforming substance called "vapor of harmony," it becomes gold. This doctrine of the transformation of mercury into other metals is 2,000 years old in China.

A RUSH OF WATERS.

The Tides of Fundy—Causes of the Great Wave.

The tides of Fundy are, perhaps, familiar to almost everyone, and though they are remarkable, like the maelstrom and other marvels, they are greatly exaggerated, writes a correspondent from Falmouth, N. S. To thoroughly understand the phenomenon the shape of Fundy bay must be considered, and it will be seen that the great daily tidal waves that sweep over the Atlantic, caused by the attraction of the sun and moon, strike the New England coast and tend northward until the great body of water is squeezed into the narrow limits of the Bay of Fundy, just as we see a great wave from a steamer entering a trough from a lake. The effect is to immediately raise the water level, and so in Fundy the tidal wave rushes in, and, suddenly compressed with the narrow bounds, immediately rises, and the water forms a wave and rushes rapidly onward, filling up the rivers and bays along its passage.

A famous place to observe the phenomenon is in what is called the Minas basin, a branch of the Bay of Fundy, that extends into the country of Evangeline and cuts it up in a curious manner. Especially at the smaller towns along the Avon river is the sight to be seen that has been wondered at by so many.

Windsor is a little town of about 3,000 inhabitants, on the elevation at the intersection of the Avon and St. Croix rivers, and is a very lively place for so small a one. Here the Avon river is about a mile in width, and if you happen to strike the river from the interior you would wonder what the inhabitants and the farmers lived upon the borders of such a gulch for. You stand upon the edge of an enormous mud crevasse, half a mile wide and extending as far as the eye can reach, and as some one refers to the river you put on your glasses and discover in the center of this slough of despond a narrow, trickling stream, about two feet wide.

Can this be the river, you ask? It must be, as there are bridges, two of them, but so woefully long and shaky on their pins and high above the stream they appear like the very ghosts of bridges on stilts. From above, the chasm appears shelved and cavernous in its aspect. The sides seem to grade off into a series of red and gray mud, until finally one can see a stone rock is reached, along which the sounds river flows. Several vessels are anchored, as here can approaching from the sea raised to keep the water moving, forms in the back country, thus again vessels lie at the docks at this place even, high and dry, miles and miles from water deep enough to float them. But we wait an hour or so, all this will be changed. We think notice the silvery thread of water stealing in sooner, then the water is seen to flow up stream, and if you turn your back for a few minutes you find upon again looking that the silvery thread has grown to a stream fifty feet wide. Twenty minutes later it is a raging torrent, as wide as the Schuylkill, foaming, roaring, and boiling, rising in waves that break against each other, ever pushing on, as if propelled by some mysterious force.

In this sudden rush of the waters animals are often caught; pigs that have wandered out into the mud are overcome by the onward rollers, and fowl have been seen surrounded and floated away on the waves, to be rescued, perhaps, far up the stream, thirty feet higher than the spot where they were taken up. Flocks of birds frequently follow the tidal wave, or bore, as it is called, feeding upon the fish that are cast ashore, and catching them as the tide goes out.

Why the waves should be so high in coming in is explained in different ways. One theory is that it is formed by the tidal current rushing against the current of the river, and passing over obstructions of more than ordinary height that tend to push the water up. In the Hoogly river the wave rises to a height of twenty feet; in the Amazon thirty, and in the Tsientang, China, about the same. The wave in Fundy, however, is not to be compared to these in any respect. As to rapidity, the tide comes in about as fast as an ordinary horse can trot, and a man would have to exert all his speed to escape.

The height to which the water actually rises differs in different places, and depends upon circumstances. Thus, if the sun and moon could pull together, so to speak, and a strong wind set in at the same time, an exceedingly high tide would be the result. It is claimed that it has risen sixty feet at Moncton; at Sackville a fifty-foot fall and rise is common; at Quaco, thirty-four feet, and at Parrsboro, opposite Cape Blomidon, about forty-five feet. These are remarkable figures, and the sight of vessels that, say, in the morning have been alongside the dock, now forty feet below and no water in sight is still more remarkable.—*Boston Herald.*

Progress in Electrical Science.

Perhaps we have arrived at that stage in our study of electricity where our instruments are too coarse to enable us to extend our investigations. Yet how delicate and efficient they are! Compare the instruments employed by Franklin, and even by Faraday, with those which are in constant use to-day in our physical laboratories. Franklin, by the utmost effort of his imagination, could not conceive, probably, of a mirror-galvanometer that can detect the electrical action of a drop of distilled water on two so-called chemically pure platinum plates, or of a machine that can develop from the feeble magnetism of the earth a current sufficiently strong to light the city of Philadelphia. Let him who wanders among the historical physical instruments of many of our college collections stand before the immense frictional electrical machine of Franklin's day, or gaze upon the rude electrometers and galvanometers of that time, and contrast Franklin's machine with the small Toepler-Holtz electrical machine which with a touch of the size gives a spark ten times stronger than Franklin's; or the electrometers and galvanometers of Faraday with the mirror-galvanometers and electrometers of Sir William Thompson. Yet, at the same time, let such an observer think of the possibilities of the next fifty years, for the advance of science is not in a simple proportion to the time, and the next fifty years will probably see a far greater advance than the one hundred years since the date of Franklin's electrical work has seen. Is not the state of our imagination like that of the shepherd-boy who lies upon his back, looking up at the stars of heaven, and trying to imagine what is beyond the stars? The only conclusion is that there is something far more than we have ever beheld.—*Prof. John Trowbridge, in Popular Science Monthly.*

The Lake of Como.

The fate of things of beauty is to become hackneyed. The choicest poetry and music are repeated until everybody is tired of them; the master pieces of art are vulgarized by constant reproduction, and even the beauties of Nature lose their freshness by being overrun and over praised. The Lake of Como has come to be a mere by-word for beauty; it can hardly be mentioned without an apology, yet it is impossible to pass by the Queen of Italian waters in silence. Many mountains, streams, and cascades have an individuality of their own; the presence of the unseen *genius loci* is felt, often unconsciously, by mankind. One might suppose that this influence would be strongest where Nature's haunts are still inviolate, among solitary peaks and pathless woods; but for me, at least, the lake of Como possesses it in the highest degree,—a personality so distinct and feminine that a beautiful woman might be jealous of it. The charm does not lie exclusively in the scenery, but is a composite result of climate, atmosphere, cultivation, and also, in a subtle, unrecognized way, of the works of art which are scattered along its shores. The lake of Como is no mountain nymph, but is Roc Titian's Venus lying naked on a magnificent couch with pearls braided in her hair.

The sheet of water is shaped like a long fish with a cloven tail, the three portions being of about equal size, the lower ones divided by a broad wedge of land, the base of which to the southward, is known as the Brianza, the point being the promontory of Bellagio. Each has its characteristics; the two lower bays or branches are called respectively the *lakes* of Lecco and Como, the latter giving its name and fame to the whole expanse. There are none of the grand and rugged features of Lago Maggiore here; the prospect is soft and alluring, embellished by two thousand years of cherishing care. The ancients were drawn hither from distant parts of Italy, and from the days of Augustus to our own, the most celebrated statesmen and men of letters have borne witness, in prose and verse, to that witchery which Ugo Foscolo declared distracted him from his work.—*November Atlantic.*

A Boston man was arrested for calling his servant a "red-head." If he had spoken of her hair as a capillary substance wearing a roseate blush like unto the brilliant hue of a golden sunset, he would have gained the applause of every resident of his city.

Fruit packers have adopted glass jars for putting up fruit. They claim that owing to the habit of unscrupulous dealers of putting up decayed and inferior fruit in tin, it became necessary for their own protection that they should use a transparent vessel, through which the contents can be seen. The glass jars are about 100 per cent. more costly than the tin cans, but can be used any number of times.

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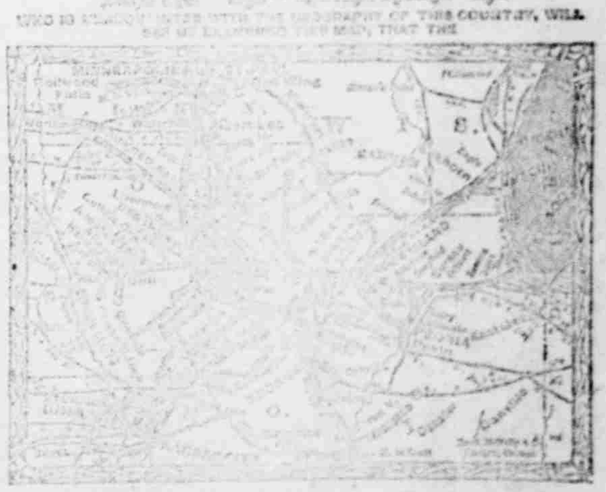

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