

THE FISHERIES EXHIBITION, LONDON.

Among the interesting novelties at the Fisheries Exhibition, London, besides the American gaslight buoy, and the pneumatic alarm buoy, is Capt. Cator's tidal buoy, which we here illustrate. It is arranged something like a ship's log, and is towed astern of a vessel in the same manner. The motion causes the screw upon the buoy to rotate, the number of revolutions varying, of course, with the speed of the ship. Connected to the spindle of the screw is a hammer which strikes a gong. A number of these buoys are used in the British navy, their special object being to denote to another vessel astern the speed of the one ahead. This is readily ascertained by counting the beats of the gong per minute.

They are intended to be used during the prevalence of fog, and although they may be serviceable for squadron evolutions, would we imagine, be of much good to the passenger marine.

A Signal Station at Mount Whitney.

The Government has determined to establish a signal service station on the summit of Mount Whitney, and during the coming summer a detail from the engineer corps at the Presidio will be sent thither to make the necessary survey for that purpose. Mount Whitney is supposed to be the highest peak in the United States, having an altitude of 14,998 feet above the sea level. It is described as "the culmination point of an immense pile of granite, which is cut almost to the center by numerous steep, and often vertical canyons." It is situated on the west border of Inyo County, Cal., near the center of the Sierra Nevada, and about 325 miles south-east of San Francisco.

The station will have an elevation more than double that of the station on Mount Washington, New Hampshire. At the latter station the winter gales attain a speed of 100 miles per hour. As the data on which storm predictions for this coast are obtained from stations north of San Francisco, that on Mount Whitney will not be as useful to this coast as the Mount Washington station is to the eastern seaboard. It will, however, serve for many important scientific purposes. The signal station at Point Barrow, the most northerly extremity of the western coast of North America, latitude 71° 24' N., is to be abandoned, and a vessel will be sent up next month to remove the party stationed there. There the winds in winter blow with a speed of over 100 miles per hour, and the mercury sinks below 50° below zero.

DREDGE FOR SHELL FISH.

The novel dredge shown in the engraving resembles in some respects a potato digger. It has a plow to run under the sand, a grating for raising the shell fish out of the sand, and a wire net or bag to receive the shell fish, while allowing the sand to wash through. The plowshare is jointed to the grating, and the forward end of the plow beam is provided with an axle having two ground wheels for guiding the plow and limiting the depth of the cut. Near the forward end of the plow beam there is a bent lever, having at the lower end a shoe for riding on the sand, and at its upper end an eye for receiving a cord which runs under a pulley and thence forward, upward, and out of the water. By pulling this cord, the shoe is thrown down so as to raise the plow beam and cause the plow to run on the surface.

This is an improvement over the present system of dredging shell fish. Mr. Augustus F. Friend, of Gravesend, N. Y., is the patentee of this invention.

What is Carbon?

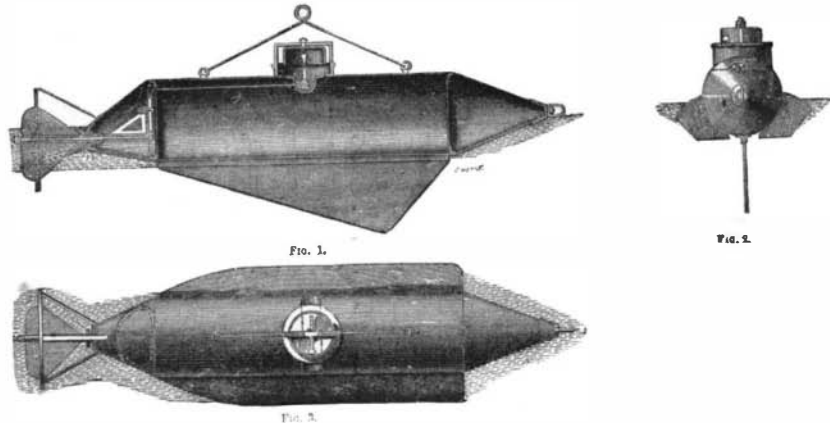
M. Berthelot, in the *Journal de Pharmacie et de Chimie*, treats of the elementary constitutions of carbon in a somewhat novel style. He says that from certain peculiar physical relations he is inclined to think that the true element of carbon is not yet known, and that it will eventually be found that graphite and diamond are not really identical, but are substances of a different order. M. Berthelot alleges that elementary carbon ought to be gaseous at ordinary temperatures, and that the various kinds of carbon which occur in nature are in reality polymerized products of the true element of carbon. Spectrum analysis is considered to confirm this view; for a spectrum recognized along with that of hydrogen in the light of comets is held to indicate a gaseous carbide, probably acetylene. If this hypothesis should be maintained by further research, it will be shown that the claim advanced on behalf of hydrogen to be considered as the fundamental element of the universe must be modified to embrace carbon. The spectrum in question is also shown by the Geissler tube.

ENGLAND, with 27,000,000 inhabitants, has only 140,000 residents of foreign birth; Germany, with 45,000,000, only 270,000; while France, with 37,400,000, has more than a million. In France there has been an increase of 200,000 in the last five years.

Fishing with Otters and Cormorants.

There is probably no known way of fish catching with which the Chinese are not familiar, and there are still some novelties to westerners in this ancient civilization. A very peculiar method is practiced by the natives on the Yungtsze River, opposite Tchang, viz., that of employing the common otter to drag the finny denizens of the muddy deep from their otherwise impregnable retreats under the high, overhanging cliffs.

From a cleft in the rock strong but slender bamboo rods project out over the water, to the extremity of each of which is attached an otter by an iron chain fastened to crossed



CAPT. CATOR'S FOG ALARM BUOY.

leather thongs round the animal's chest and immediately behind the shoulders. When resting on the bamboos, curled or doubled up, they look inanimate, and would be taken for dried skins hanging in the sun, but when required for use they are aroused to a great state of activity.

A large net is prepared with leaden weights and so sunk as to cover a considerable space of the bottom, the otter being placed under it before lowering. When once down the slaughter begins, and all unfortunate idlers are nabbed and rendered helpless by the sharp teeth of the savage animal. After a few minutes have passed the whole contrivance is hoisted up, the otter is chained to the rod, and the fish put into baskets.

Some of the otters are not in use, and it is a curious sight to watch them gamboling about as far as the iron chain will allow, splashing and diving and fighting each other.

A prominent English sportsman remarked, upon hearing this account:

"If you were to send it to the *Field*, they would certainly say you 'were a liar,' but it is hoped that the *Angler* will be quite convinced of the veracity of the tale and of the *veracity* of the otter."

A daily sight at the long bridge (Bridge of Ten Thousand Ages) over the River Min, at Foo-chow-foo, is the fleet of rafts engaged during the high water period in fishing with the aid of the cormorant, or sea raven (family of *Pelecanidae*).

The rafts are frail, light structures, composed of five long bamboos lashed together. Only one man can go on each, armed with a paddle, boat hook, and long handled net with a basket for holding the fish. The tide is very strong in the

rapidly under water, is gone about a minute, and brings up a fish in its beak, and then the paddling commences, and after a short chase the pair are hauled in by the net and the game secured. The bird is then rewarded with a tiny fish to satisfy its appetite, and launched again into the foaming current. It is wonderful to see the agility of the boatmen in keeping clear of the bridge piers during this operation; how his swift paddle catches the water and his boat darts in and out across the rips like a live thing, half under water yet floating bravely.

The poor cormorants look drenched enough as they sit waiting to be tumbled in, but they are at home when overboard and never make a miss if once a fish is sighted. A metallic ring around their necks prevents them from swallowing the larger fish, but they get a feed of the small fry on the raft and in an hour or less are not inclined to work, and must have rest till another day. Sometimes two or three of the cormorants will pounce upon one large fish, and the battle that ensues is very exciting. One bird is sure to get it, and then the others follow, trying to wrest it away, the fishermen following swiftly to bag the lot. At such times the interest of the numerous spectators on the bridge increases to shouting, and the birds get ferocious to go in again. A well trained bird will thus capture about twenty large fish in an hour, and the man will gain about a dollar by the sale of them.

The cormorants are captured when young, and are kept in wild, marshy places, fenced in for use when required, on the river. One never tires of watching them at their daily task.—*Junio, in the American Angler.*

Hong Kong, March 27, 1883.

Headwaters of the Arkansas.

The Arkansas River rises in the Tennessee Pass, nearly west of Mount Lincoln, in latitude 39° 21' and longitude 106° 19', and flows a little east of south for a distance of about eighty miles in a straight line, when it flexes to the east, and flows through a deep canyon in the granite, and emerges into the plains near Canyon City. Near the junction of the east branch of the Arkansas, the valley, with the terraces on either side, continues pretty regularly about five to eight miles in width, but gradually closes up again below Lake Creek, though on either side are vast deposits of the coarse drift material extending high up on the mountain sides, especially on the west side of the valley. The valley then gradually expands out and enlarges, about five to ten miles in width, for a distance of nearly forty miles.

On either side of the valley small streams flow into the main channel of the Arkansas, from the source to Canyon City. These streams usually have their origin at the very crest or water divide of the two ranges, and, in most instances, have cut their way through the solid mass to the main river. Many of these streams have numerous side branches, which have also carved out wonderful gorges near the crest of the mountains, giving to these mountain ranges a ruggedness that is almost inconceivable to one who has not actually explored them. It is in the study of these

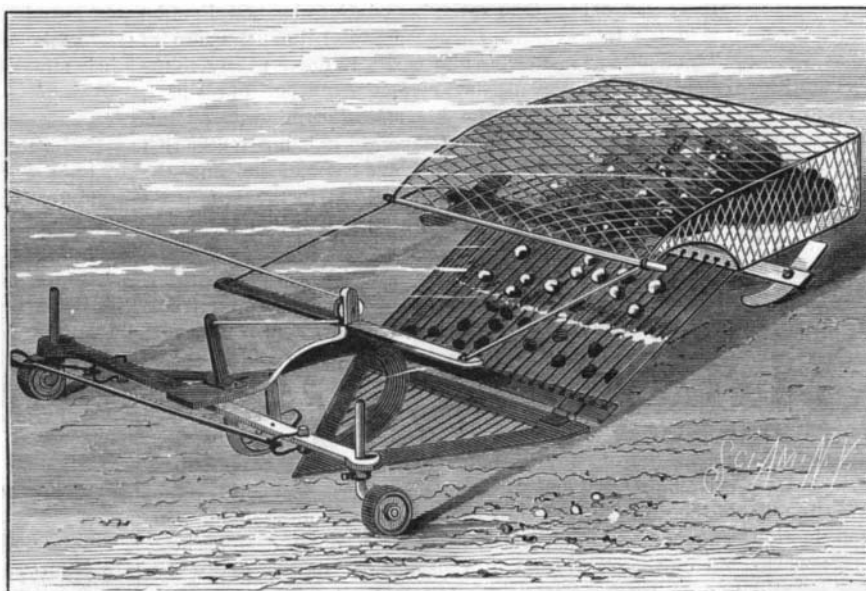
gorges that the geologist learns to appreciate the immense results of erosion in giving form to the rocky range of the West. Even yet the power of this force has not been adequately understood, but the wider our range of observation, the greater is our conception of its power. We may safely assert that at some period comparatively modern, 10,000 or 15,000 feet of sedimentary beds extended uninterruptedly from the South Park across the interval now occupied by the Sawatch range, all of which but insignificant remnants have been swept away, while a mass of the granite nucleus, of inconceivable dimensions, has also been removed. The general elevation of the Sawatch range for sixty to eighty miles is 13,000 to 14,000 feet above the sea at this time, and it is highly probable that hundreds and perhaps thousands of feet have been removed from the summit.

In 1845, Fremont, at that time a lieutenant in the Corps of Topographical Engineers, skirted the northern border for a short distance. He came up the Arkansas

River, crossed the main divide at Tennessee Pass, and traveled down Eagle River as far as the mouth of the creek. Here he crossed the river and took the trail over to White River, which stream he followed down some distance, then crossed the country to the Green River, thence to Salt Lake City.

The pass was named after General Fremont. The Arkansas River is, next to the Missouri, the largest affluent of the Mississippi. It rises at the west central part of Colorado, and its length is 2,170 miles. It is navigable for steamers 800 miles from its mouth, during nine months of the year.

THE white perch of the Ohio are noted for the musical sounds they make. The sound is much like that produced by a silk thread placed in a window where the wind blows across it.



FRIEND'S DREDGE FOR SHELL FISH.

vicinity of the bridge, and the utmost dexterity is required to prevent the slender rafts from overturning, but the fishermen are quite accustomed to being thrown into the water, and so evince no fear.

The cormorants are extremely voracious and are purposely kept in a state of hunger, so that their natural instinct will induce them to dive for their prey. Each raft is provided with two or three birds, and the sport begins.

The birds are apparently very dull and stupid as they crouch down on the raft, and look like a lot of dirty old geese, but once launched into the water they show amazing activity, and prove that their stupidity is only assumed. How they manage to see the fish under water is a mystery, for it is full of mud and of a dirty yellow color; but that there are fish you may quickly find out. The bird darts