years, for the intervention of the uninjured hand was required in order to flex or extend them, and hence their usefulness was very limited. Besides, only wealthy persons could afford to purchase them. Now, however, a workingman can buy for 100 francs ($20) the artificial arm invented by Dr. Gripouilleau which will enable him to continue at work, while for 500 francs ($100) or less, a wealthier patient can even conceal his deformity by the use of one of the ingenious contrivances of modern Parisian makers. The illustrations show some of the latest models, including arms with elbow joints, with rigid or jointed fingers and various accessories, such as knives, forks, and spoons. The manufacture of these artificial arms is very similar to that of artificial legs and feet. The hand and fingers are carved in wood, after a cast, the iron parts are added and the whole is covered with leather.

For the treatment of fractures and ankyloses molds or rigid bandages are employed which exactly fit the part of the body to which they are applied. They are made of stiff wire, upholstered and covered with cloth. In the illustration which shows women padding and covering the frames the large molds, at the right, represent the appliance devised by Dr. Bonnet and commonly used in the treatment of hip joint disease.

The frames of corsets or cuirasses are often, for the sake of lightness, made of perforated plates of aluminium, hammered to the proper forms on a mold. The frames are then padded and covered. Orthopedic corsets for the treatment of rickets vary in type according to the nature of the case, but always consist essentially of girdles of leather molded to the form of the body and provided with supports for the shoulders in the form either of gussets or of vertical braces which are made extensible so that they can be easily applied and removed, and adapted to the growth of the child. In some cases horizontal and back braces and plates are added to correct protruding shoulder blades or a back too hollow or too greatly arched, or to frame and protect a hump without exerting painful pressure. These cuirasses, which with their side braces support and tend to straighten the spine, are fitted carefully to a cast of the body before they are assembled and finished.

The essential parts of a truss, or herniary bandage, are a pad which is applied to the rupture and a belt or spring which holds the pad firmly in place. Of the numerous forms of trusses now in use, some are flexible, some are rigid, and some operate by means of springs. The spring trusses, which are the best, are of two types, French and English. In the French truss the pad is attached to a padded spring which is curved to fit the body and partially surrounds it, the circuit being completed by a leather strap of which the free end is buckled to the pad. The English truss has two pads placed at the ends of a curved spring which envelops the side of the body opposite to the rupture, pressing one pad firmly against the rupture while the other serves as a point of support at the back. In the manufacture of either variety of bandage the springs and rivets and the central metal plate known as the shield are made by men, while women cover them with chamois skin, lined with wool or silk, and attach the straps.

SOME STRANGE SOURCES OF WATER POWER ON THE COAST OF DALMATIA.

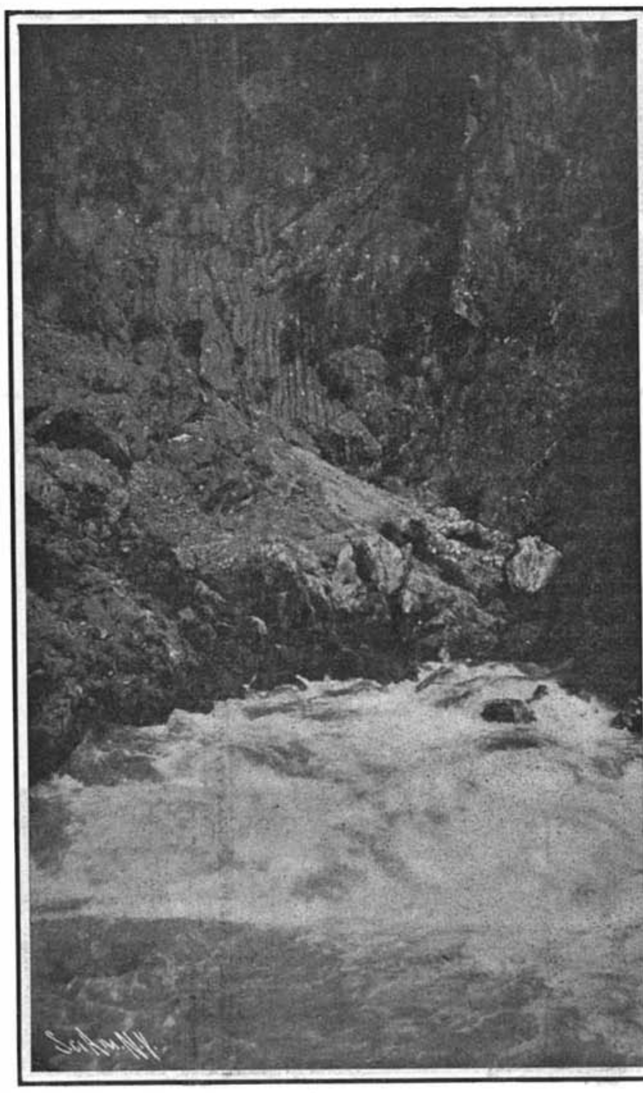
BY PROF. ARTHUR L. WILLISTON.

Nature has, in every quarter of the globe, many surprises, but few of these that have come to my notice, have impressed me with more interest than did two very strange sources of water power which I visited a few months ago, while cruising along the Dalmatian coast on the east shore of the Adriatic Sea.

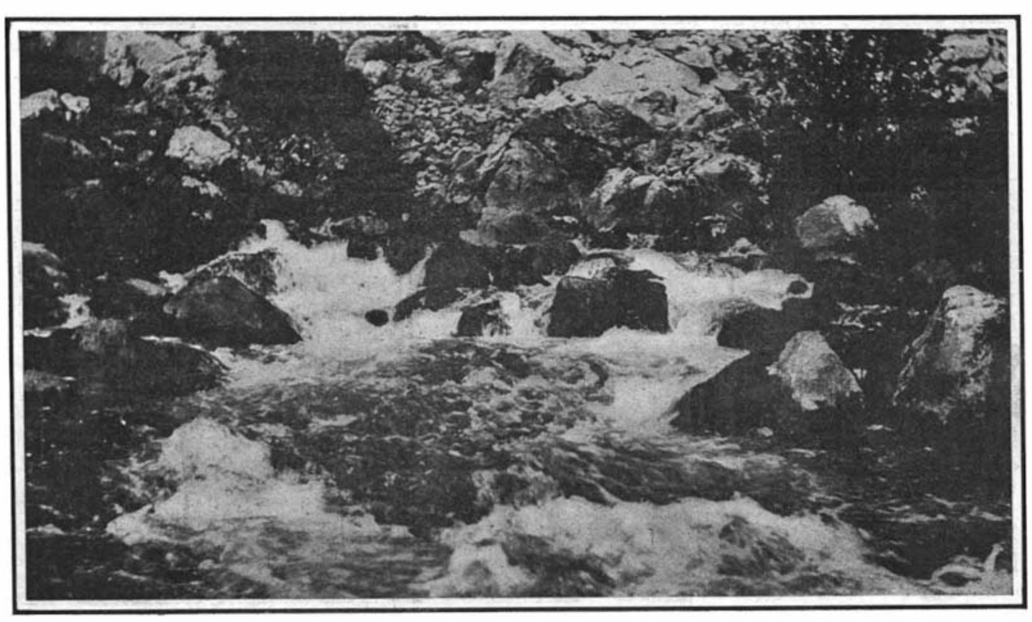
The first of these was situated in the Breno Valley—a small and fertile valley with rugged, barren mountains overshadowing it on almost every side, and lying ten or twelve miles to the southward of the quaint and picturesque town of Ragusa, whose ancient and turreted walls date back for many centuries. Here, at the base of the cliff, which rises abruptly for hundreds of feet, gushes out of the face of the rock what, excepting for its surprising volume, looks much like an ordinary mountain spring. There is nothing else in the surrounding landscape which would indicate the possible presence of such a volume of water as comes boiling and foaming from its hidden source. One of the accompanying photographs shows it just as the water is issuing from the rock. A few hundred feet from its source a small portion of the stream is used to operate an old grist mill.

But farther down the coast, seventy-five or a hundred miles, is another even more extraordinary illustration of the same kind of a source of power, which discharges its water into the almost land-locked harbor of Cattaro. As we continue southward along the Dalmatian coast, the mountains which skirt the shore grow more rugged and precipitous and much higher, until, when Cattaro is reached, we find them with their tops here and there continuously enveloped in a white mantle of snow; and as we thread our way through the intricate passages that lead into the harbor, they rise so abruptly from the surface of the water as to make it seem impossible for us to advance further, so close together and so high above our little steamer do they tower. We are passing through what resembles one of the grandest of the Norwegian fjords and the region from which Montenegro takes its name. Here is the military road that Freeman describes which leads from the peaceful little town of Cattaro to the frontier line which divides Dalmatia from Montenegro as a "staircase which climbs on, up and up till it seems lost among the higher peaks."

In such a region surrounded, as has been said, by mountains on some of which the snow seldom or never disappears, we would expect to find water flowing in streams through the natural divisions between the mountains, or falling precipitously over the cliffs as it does in so many places in Switzerland, but as we look about in the harbor of Cattaro we see no evidence of anything of the kind. Instead of this we find, just as we enter the inner harbor, another spring similar to the one in the Breno Valley, which has just been described, but far more powerful. Its origin is underneath one of the highest of the mountains, and the wall of rock rises almost perpendicular above it. The first photograph shows the character of this wall of rock, and also shows the spring with its boiling surface as it issues forth, apparently under a terrific pressure. The photograph does not give a proper appreciation of the width of the stream here because of the massive cliffs which surround it, but it does suggest the condition of foam and spray, which indicates in turn the velocity with which the water is flowing. Standing on the bridge or on the banks above this stream, one tries to form some estimate of the volume of the water that is flowing beneath, and gradually one comes to the realization of the fact that it is only when one thinks in such terms as the volumes of water which flow in the Merrimac or the Connecticut or Hudson rivers in freshet seasons, that any true conception can be obtained of this underground torrent that springs from the rock at Cattaro.



The Spring at Cattaro Issuing from Beneath a Cliff.



Remarkable Stream in the Breno Valley Issuing from the Rock.

SOME STRANGE SOURCES OF WATER POWER ON THE COAST OF DALMATIA.

Whistle Signals for Power Boats.

How many power-boat owners know the various whistle signals, as given by steam and power craft equipped, as the law demands, with proper whistles, for exchanging or giving whistle signals? A long blast of the whistle when a steam vessel is leaving a wharf or slip is a warning to passing craft, and is an important one. A short, sharp blast at about the same time is a signal to cast off the lines from the wharf. When a captain meeting any power craft desires to signal that he prefers to pass to the right or starboard, he challenges with one blast, which, if satisfactory, must be answered by the other boat. If, however, the other craft is unable to answer with one blast and finds it inexpedient or inadvisable to go to port, its master may answer with two blasts, each thereby agreeing to pass to the left. If the signals are misunderstood, or there is a possibility of collision, both should signal to stop and reverse, at the same time sounding three short, sharp blasts, to show that the signals are misunderstood and to warn other craft that they are backing and have probably lost steerage way; when properly straightened out and the single or double blast has been returned, they both proceed. Three long blasts of the whistle denote a salute. Four long blasts are used in case a vessel is not under control, as may happen with broken wheel rope or other trouble with the steering gear or engine. Continued long blasts denote danger and are used to summon assistance. If you get in the way of a larger boat a rapidity of short toots is usually sufficient to send you scurrying to one side. Other prearranged signals are often used, as a towboat's private code to shorten or lengthen the towline or the two long and one short used by pilots to salute known members of a local harbor of Masters and Pilots, as this fraternal and protective order is styled. Whistling of boats is often unnecessarily prolonged or indiscriminately indulged in, so that federal laws have been sought to regulate the evil in and about New York and other crowded harbors. The local steamboat inspectors have issued special instructions to all pilots and masters holding licenses issued through the New York district, to abate as much as possible what had become an intolerable nuisance. Not included in the above is the condition arising when one power craft may challenge the other with a single long blast, meaning that he intends to pass to the right or starboard, or two blasts indicating a wish to pass to the left or port. The single blast must be answered by two blasts or the two blasts by a single blast, the course of the challenged craft being at the same time changed to allow the challenger to pass as indicated by signals.

There are said to be at present 250,000 miles of cable in all at the bottom of the sea, representing $250,000,000. This works out at about $1,000 per mile to make and lay.