THE TEACHING OF SWIMMING.

All those who occupy themselves with natation know how difficult it is, at least for certain persons, to learn how to swim. This may appear somewhat strange when we know that the human body is sustained naturally in water. It is the slightly too elevated position of the center of gravity that obliges man to make certain motions in order to keep his head in the air and also in order to move forward in the liquid element. At all events, the exertion to be made must be very feeble, and the motions to be effected are very simple. They must especially be regular and be executed without precipitation. They can therefore be learned by every one without distinction. But many people cannot succeed in ridding themselves of a sort of instinctive fear, which, as soon as they are in the water, makes them lose their heads, so to speak, and causes them to make irregular and precipitate motions. They immediately get fatigued and cannot succeed in keeping their heads above water. Struck by this fact, teachers of swimming have endeavored to make the pupil repeat in the air the motions that he must effect in water, thinking that such exercises might prove of some utility. Formerly, for example, the pupils were made to execute, standing, the motions of natation, in moving the left limbs and then the right ones simultaneously. Later, the idea occurred to teachers to make the limbs effect the general motions in a horizontal position, always with the idea of more closely approaching the conditions of natation in water. There was then used a bench or wooden horse, upon which lay the pupil, who did his best to simulate the motions of extension and flexion that he would have to make in water. But the position upon the apparatus is very fatiguing. The chest is oppressed, respiration is interfered with and the exercises cannot last beyond two minutes. The elbows and knees touch the horse and the simulated motions are necessarily incomplete. Moreover, there is nothing to guide the pupil in the execution of the motions, unless he applies close attention and much willingness thereto.

All such inconveniences would be of slight importance were the practice of these theoretical exercises to lead the pupil to sustain himself easily upon water; but such is not the case, and many persons, despite the repetition of preliminary exercises, and despite their most ardent desires, cannot succeed in learning how to swim. The reason of such want of success is easy to understand: It is that there is nothing comparable between the motions that the pupil makes in the air and those that he makes in the water. Upon the horse, for example, his head and his limbs are unsupported. He finds himself in nowise in the condition in which he is in a mass of liquid, wherein, according to the principle of Archimedes, the entire body is sustained by the surrounding liquid, and wherein, on another hand, the limbs, in order to force back the water, have a harder work to perform than in the air.

Again, efforts have been made to teach a child how to swim by supporting him in the water and causing him to effect the motions of natation. This is the most practical process. Its inconvenience is that it necessitates the presence of a teacher with each pupil, and, in a large class of children, the teacher cannot occupy himself with each of them for a very long time. When the execution of the motions made by the pupil begins to be perfect, it is not yet finished. The efforts that the supported child has to make are relatively very feeble, and when he is placed all alone upon his own resources, without auxiliary aid, he finds himself a little disconcerted, and, provided instinctive fear seizes him, he will become paralyzed in his efforts, and will succeed with great difficulty in being able to swim alone.

Mr. Devot has been able to overcome all the difficulties of the preceding method in a very ingenious manner. His apparatus permits the pupil to learn to make the theoretic motions of natation perfectly in conditions entirely identical with those that present themselves when he tries to sustain himself alone in the water. The apparatus consists of two parts. One is fixed and serves to sustain the head and chest. The other is movable and serves to guide the limbs in the accomplishment of their motions. The fixed part is formed of a chest support, A, inclined toward the rear and provided with three legs. This support presents an appendix which carries a chin support, B, upon which the chin of the pupil rests. The body of the pupil upon the apparatus is in the very position that the body of a swimmer occupies naturally in water. The movable part is the really interesting feature of the apparatus. The direction of the motion of the arms is effected through the aid of two rubber straps fixed at one end to the chin support and terminating in wooden knobs serving as a support for the hands. The direction of the motion of the legs is obtained by the aid of rubber cords. To this effect, the hind legs of the fixed part are provided with horizontal crosspieces, CC, movable around a joint. The crosspieces carry uprights, DD, terminating at the upper part in two forks that carry a piece, E, movable around a horizontal axis, and which is designed to receive the thigh, whose movements it is capable of following. The uprights, moreover, are movable upon the crosspieces, where they may be fixed by pressure. The apparatus

tions are easy. His respiration is always free, and he can easily remain upon the apparatus for fifteen minutes. He can, therefore, repeat the motions a great number of times and become accustomed to them. As well known, when we become accustomed to repeat a motion, always accomplished under the same conditions, we do so in spite of ourselves. It becomes natural and fatigueless through practice.

The child, therefore, gets into the habit of making the same regular motions upon the apparatus that he has to make in water, owing to the rubber straps that serve him as guides and that have at the same time the happy effect of making him find the same resistance and the same bearing points as in water. The length of these straps is so calculated as to oblige the most awkward person to make, after a manner, perfect motions automatically, without his having to attend to anything else than the giving of the initial propulsion. The rubber rods force, conduct, and direct the motions begun in an exact and sure manner. The pupils learn the elements of swimming in a very short time, despite themselves, without attention and without effort. This is the great merit of the invention; so we cannot praise the inventor too much for the admirable patience that he has shown in perfecting, piece by piece, all the different parts of his apparatus, which, at present, may be considered as nearly perfect. It realizes a great progress in the teaching of natation that it would be unjust not to recognize. When the instruction of the pupil upon the apparatus is complete it is finished. Despite the paradoxical appearance of the fact, the pupil knows how to swim. When he enters the water he is no longer bewildered. He instinctively makes the same motions to which he is habituated. He at once feels himself sustained in the water, gains confidence, and has no longer anything to do but perfect himself progressively by practice. The result is certain and very rapidly obtained.

The preceding considerations are not solely theoretic conditions. They are supported by experience, and it is thence that they take all their value. The apparatus is in use among the pupils of the Michelet Lyceum, who have been the first to benefit by the invention of their master, Mr. Devot, who has received the unanimous felicitations of all those who have been witnesses of the great advantage that his new apparatus presents and of the facility with which his pupils learn the principles of natation, formerly so difficult—for certain persons at least. Thanks to it, now, there will be no more deception. All persons using the apparatus will quickly learn how to swim.—*La Nature.*

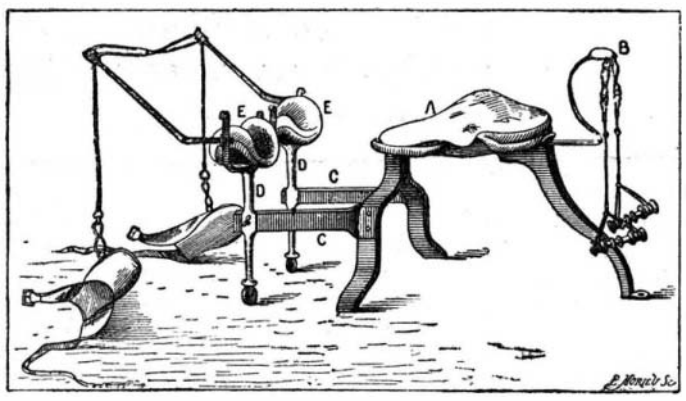


Fig. 2.—DETAILS OF SWIMMING APPARATUS.

A, chest support; B, chin rest; E E, support for the thighs; D D, uprights; C C, horizontal crosspieces.

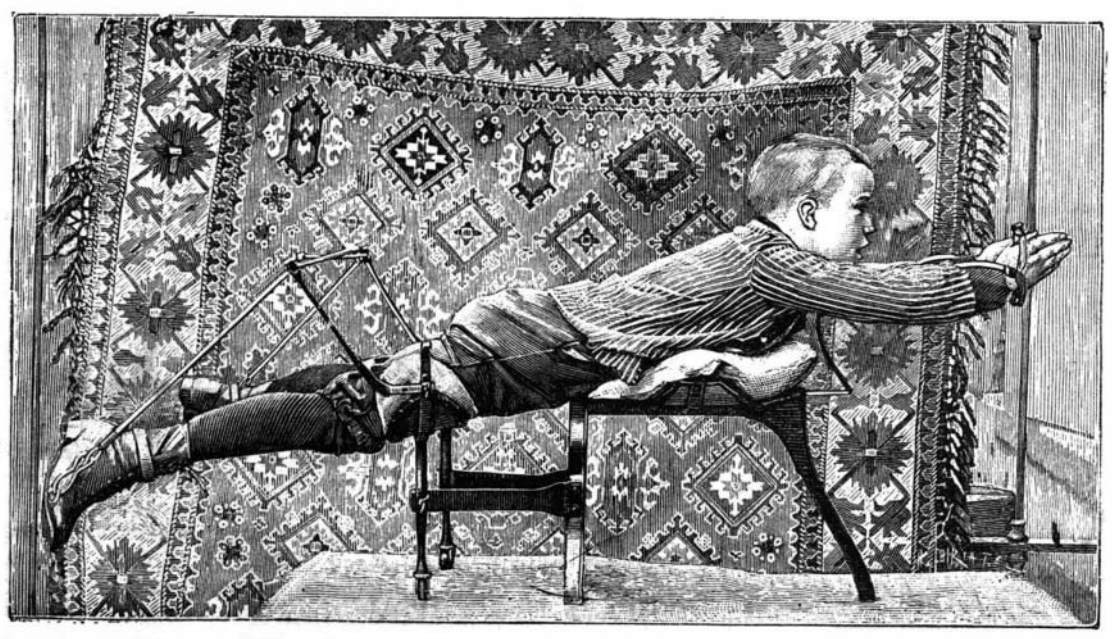
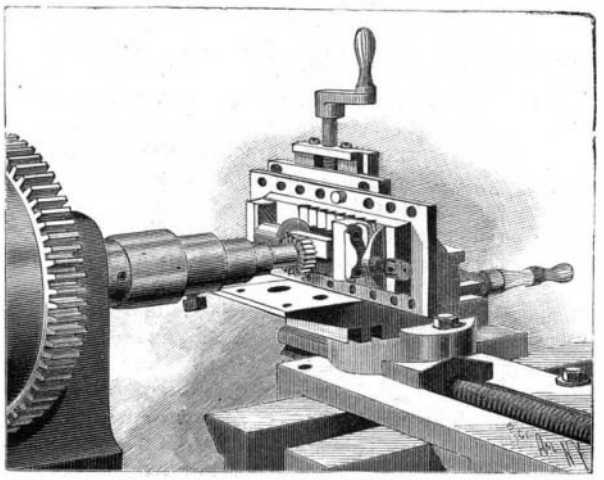


Fig. 1.—APPARATUS FOR TEACHING SWIMMING.

A LATHE SLIDE REST ATTACHMENT.

The illustration represents a recently patented improvement of Count Strickland, of Villa Bologna, in



STRICKLAND'S LATHE SLIDE REST.

the island of Malta. It consists of a simply constructed attachment to the slide rest of an ordinary lathe, whereby the work may be moved vertically as well as longitudinally and horizontally in front of the milling tools or cutters held on the spindle of the lathe. On the ordinary slide rest, horizontal and longitudinal slides are usually secured, and the attachment is bolted on the front end of the upper one of these slides by a bracket in which is held a vertical slide. Projecting from the latter are work clamping dogs, on the vertical slide or on a horizontal shelf, on which dogs are vises or division plates for gear cutting, to which the work may be conveniently secured, so that it can be moved to or from the cutter in a vertical plane, its longitudinal and transverse movement being effected by the other slides. The device is of very simple and inexpensive construction.

Electro-chemical Effects on Magnetizing Iron.

In the proceedings of the Royal Society, Mr. T. Andrews calls attention to the electro-chemical effects on magnetizing iron. From a long finely polished rod two steel bars were cut adjacently, so that they were practically alike in general composition and structure. These bars were both weighed, and then immersed in equal quantities of cupric chloride solution, one of them having previously been magnetized. After a certain time (6 to 24 hours) they were taken out of the solution, freed from deposited copper and carbonaceous matter, then dried, and again weighed. It was found in every case that the magnetized bar had lost more in weight than the unmagnetized bar. For instance, an average of 29 experiments showed an increase of corrosion in the steel due to magnetic influence of about 3 per cent under the conditions of experiment. It may be mentioned that the bars were not highly magnetized.