right foot. The consequence of doing so is, that when three-fourths of the circle is completed, the off-foot gives a furious sway to the body, and the skater spins round on his right foot, changing at the same time from the outside to the inside edge, and cuts the second half of the 3 backwards. When the skater can do this easily with the right foot, he should practise it with the left; and when he can cut the 3 with equal ease with either foot, he should cut two together. He begins with the left-hand 3, starting with his left foot on the outside edge; when he gets to the twist of the 3 he spins round, and finishes the figure (still with the left foot) *on the inside edge backward.* His right foot is now at liberty to pass to the top of the right-hand 3, which he cuts in like manner. Especial care must be taken to keep the knees straight, and to preserve a graceful carriage of the body. If the skater should be so far off his balance as to find any difficulty in spinning round, he will gain his object by throwing his weight a very little toward the toe of the skate. The reason why the skater curves round in this twist is, that the steel of the skate has a curved form; and when for a moment the body is quite upright, the whole skate spins round on its centre, as on a pivot.

GENERAL DIRECTIONS FOR PERSONS LEARNING TO SKATE.

1. Let your dress fit closely, but at the same time be of sufficient ease to insure freedom of motion. Neither skirts to coats nor full trousers should be worn. Knickerbockers and stockings are best.
2. Let flannel be worn next the skin by the delicate, and an extra undergarment by the robust. Let the chest be well defended against the cold. A piece of brown paper laid between the waistcoat and shirt is one of the best chest protectors.
3. Be careful in venturing upon the ice, unless it be sufficiently strong to bear the weight of the number that flock to it; and watch for the increase of numbers, that you may retire before danger ensues.
4. Avoid rough and very smooth ice, and look carefully out for obstructions thereon; such as small twigs of trees, stones, or "hobbles;" as well as for rotten ice, cracks where the ice has risen higher on one side than the other, or holes. Should you suddenly come upon rotten ice, do not stop, but pass over it as rapidly as possible. Should you fall down upon it roll lengthwise toward the firmer part, without attempting to stand or walk upon it.
5. Should the skater fall into a hole, he should extend his arms horizontally across the edges of the ice, till a rope can be thrown to him.
6. After an unlucky immersion in the water, the unfortunate skater should immediately take off his skates, and, if able, run home as quickly as he can. He should then pull off all his wet clothes, rub himself thoroughly with dry towels, and go to bed.

A FEW FACTS ABOUT SWIMMING.

BY

C. M. DANIELS, NEW YORK ATHLETIC CLUB.

THE art of natation has been known for many hundred years, in fact, dating back to 880 B. C., the date found on several pieces of Assyrian sculptured work, representing human figures swimming, which are now in the British Museum.

It was not until lately, however, that the sport was seriously recognized as a means of exercise and competition. Thirty years ago we find all swimmers were using the breast stroke, such as is taught to all beginners. Later the side or English racing stroke was used, but it was to Col. Trudgeon that all credit is due in regard to the discovery and perfection of the trudgeon, the stroke used by all speed swimmers for all distances; the improvement over the old side-stroke being in the less resistance offered by the air in bringing the arms forward than by the water.

People began to say then that the limit had been reached; the time taken by the fastest swimmers to cover 100 yards was about one

minute. To Dick Cavill of Australia belongs the great achievement of introducing the fastest stroke known to date, the "crawl." He found that he could swim nearly as fast without the use of his legs as he could with them, using the old stroke; and reasoning that the legs are the strongest part of a man's body, he set about to acquire a kick with his legs which would lessen the resistance and be of more benefit to him than the old stroke was, with the result that the "crawl" became the fastest stroke known. In this stroke the swimmer is nearly flat on his chest, the arms are worked the same as with the trudgeon and the legs are bent at the knees, the feet raised above the water a few inches, then brought down with a snap. With this new stroke swimmers were able to reduce their times from four to ten seconds for the hundred yards.

A great many people express surprise when informed of the fact that Americans are inferior to the English and Australian swimmers; the explanation is simple. Australia lying so near the equator boasts of a summer lasting some eight or nine months, and during all that time the water remains warm enough to make swimming not merely feasible, but a pleasure. While England, the Mecca of all speed swimmers, does not possess so much outdoor bathing, it possesses innumerable public baths in all the large towns and cities, enabling the public to bathe, for the small sum of ten cents, throughout the year. In London there are fifty-six of these baths as against the two in New York at the present time of writing. Thus it can easily be seen why we are at such a disadvantage.

As a physical benefit there is not a better sport, in my estimation, than swimming. It brings into play all the muscles of the body as evenly as possible, the deltoid and back muscles being exceptionally developed. There is no sudden strain as in a great many athletics, and the breathing is performed at regular intervals. I think swimming should be instituted in all the schools and colleges, not only because it is one of the most agreeable forms of sport, but because you can never tell when it will be of the most use to you, until comes the moment of most urgent need.

SWIMMING TAUGHT BY LAND DRILL.

By Prof. Alexander Meffert, Chicago Athletic Club, Chicago, Ill.

The movements of the body in swimming are known as the arm and leg strokes. In making them the human figure assumes four attitudes, though there are really only three motions. The first attitude invariably should be on beginning the exercise or stroke. A pupil who faithfully follows the instructions given, which constitute a thorough land drill for acquiring the art of swimming, will very readily swim on going into the water and putting the lessons contained herein into practice.

Position 1-A.—For beginning the stroke. Stand erect, heels touching, arms extended on a slight angle in front of the line of the body, with the thumbs together, palms outward, hands at an angle of 45 degrees, the little fingers edge uppermost, fingers and thumbs compressed.

Position 2-A.—Sweep the arms downward and backward until they are almost at right angles with the body when standing erect. There should be no bend of the arms, the elbows remaining stiff. This constitutes the first motion.

POSITION 3-A.—Bend the elbows, drop them to the side, sweep the hands together, palms inward, finishing the movement as the tips of the fingers touch under the chin. While the arms are making this movement another should be in progress by drawing the *right* leg upward until the knee nearly touches the trunk of the body, sole of the foot outward, toes pointing toward the knee. The proper finish of this movement leaves the *right* leg extended, well off the ground, and the hands touching under the chin. This constitutes the second motion.

POSITION 4-A.—Is reached by straightening out the right leg as if to kick a person or object standing well off to the right side. When the limb is extended sweep it downward until the heels touch. Simultaneously both arms should be extended from the pose of Position 3-A until they meet, fully extended, above and slightly in front of the head. This constitutes the third motion.

POSITION 1-B.—This again is as it should invariably be for beginning the stroke. Stand erect, heels touching, arms extended at a slight angle in front of the line of the body with thumbs together, palms outward, hands at an angle of 45 degrees, little fingers edge uppermost. Fingers and thumbs compressed.

POSITION 2-B.—Sweep the arms downward and backward until they are almost at right angles with the body. There should be no bend of the arms, the elbows remaining stiff. This constitutes the first motion.

POSITION 3-B.—Bend the elbows, drop them to the side, sweep the hands together, palms inward, finishing the movement as the tips of the fingers touch under the chin. While the arms are making this movement another should be in progress by drawing the *left* leg upward until the knee almost touches the body, sole of the foot outward, toes pointing toward the knees. The proper finish of the movement leaves the *left* leg extended and well off the ground and the hands touching each other under the chin. This constitutes the second motion.

POSITION 4-B.—This is reached by straightening out the left leg as if to kick a person or object standing well to the left side. When the limb is extended sweep it downward until the heels touch. At the same time both arms should be extended from the pose as in position 3-B, until they meet, fully extended, above and slightly in front of the head. This constitutes the third motion.

POSITION 1-C.—The body is once more in the proper pose for beginning a stroke. Erect, heels touching, arms fully extended at a slight angle in front of the line of the body, thumbs together, palms outward, hands held at an angle of 45 degrees, little fingers edge uppermost, fingers and thumbs compressed.

POSITION 2-C.—Sweep the arms downward until they are almost at right angles with the body. Avoid bending the arms and keep the elbows stiff. This constitutes the first motion.

POSITION 3-C.—Bend the elbows, dropping them to the side, sweeping the hands together, palms inward, finishing the hand motion as the tips of the fingers touch under the chin. While this movement is being completed stoop the body to a crouching posture. This constitutes the second motion.

POSITION 4-C.—Extend the hands upward until they meet fully outstretched above and slightly in front of the head. During this action straighten the lower limbs from the crouching position as in 3-C until the legs are once more fully extended with heels together and body entirely erect. This constitutes the third motion.

NOTE.—Though the arm and leg positions are described by four figures, there are in reality only three motions to the arms and two to the legs. The first in each of the series of positions indicates only how the body should be at the outset. The initial motion is described in each series in position two and to fully impress the motions upon the mind of the pupil should be counted in one-two-three order, the count invariably beginning with position two. Example—count "one" as the hands sweep downward from the initial or key position, to the pose in position number 2; count "two" as the hands and legs are brought into the pose in position number 3, and count "three" as the limbs are returned to the pose in position number 4.

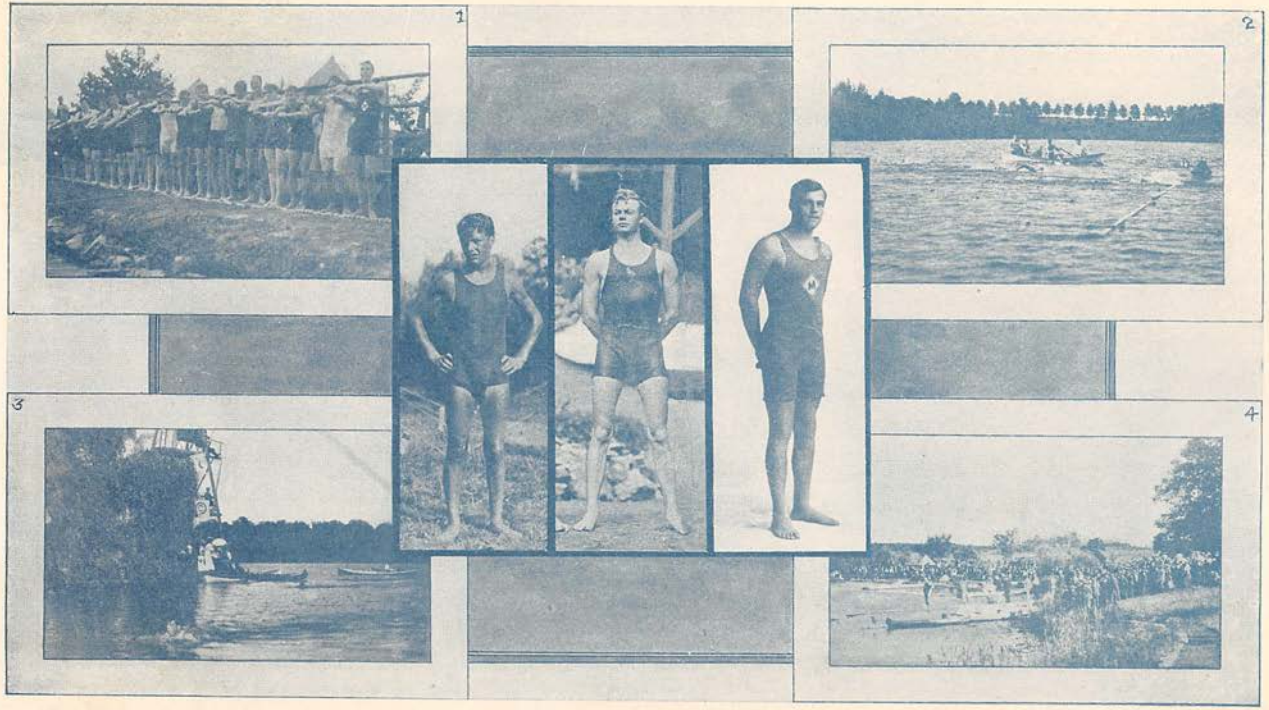
BREATHING.—As the arms sweep downward (counting one) inhale deeply and hold breath until the arms are extended for third motion, when the pupil should exhale.

SWIMMING: SOME PRACTICAL RULES.

RULE 1.—*Keep the hands and feet well below the surface, and immerse the whole body up to the chin.*

The reasons for this rule are simple; the flotation of various bodies is exactly in proportion to the quantity of water displaced. No man can stand upright upon the water, because the amount of water displaced by the soles of the feet would not counteract the weight of the body, and it will be seen, by the simple carrying out of this principle, that exactly in proportion to the immersion of the body is it sustained by the water.

All practical swimmers know that when a man swims with his whole head and part of his shoulders out of water, he cannot endure for any length of time, because the force that ought to be used in propulsion is wasted upon sustaining the body.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THE GREAT SWIMMING MATCH FOR THE WORLD'S CHAMPIONSHIP AT ST. LOUIS, 1906

1. A Few A.M.M. Swimming Candidates.
2. The 220-Yard Swim.
3. Goessling winning back-stroke race.
4. At the Finish.
5. H. J. Handy, C.A.A.
6. C. M. Daniels. (The Champion Swimmer.)
7. Marquard Schwarz.

Every inch of the body that is raised above the surface becomes a dead weight, pressing the body under water and calling for great exertion on the part of the swimmer. Many persons, when they fall into the water, plunge about and try to lift themselves out of it, acting as if they were attempting to kneel upon its surface. This action is instinctive, and is one of those where instinct is inferior to reason. In point of fact, ninety-nine out of every hundred who perish in the water, drown themselves as effectually as if they had tied a heavy weight round their necks.

The weight of the head, breast, and arms of a human being is, on the average, about forty pounds; and when a drowning person lifts those portions of the body above the surface, he practically acts as if he fastened a forty-pound weight upon his head.

RULE 2.—*Hollow the spine and throw the back of the head upon the shoulders.*

Bulk for bulk, the body of an ordinary human being is about the same as that of the water. There are, however, two exceptional portions—namely, the head, which is somewhat heavier, and the chest, which is much lighter. Any one will, therefore, see that it is most essential to support the former upon the latter, as well as to make the water support both as much as possible.

By hollowing the spine and throwing the back of the head upon the shoulders, the heavy, solid mass of the brain is supported by the air-filled lungs, and the eyes and nostrils are kept above the surface. As to the mouth, that may be above or below the surface, for, if the lips be kept firmly closed, and respiration conducted through the nostrils, no water can enter.

The chief object in hollowing the back is, that it aids the swimmer in keeping his nostrils out of the water. No viler habit can be found than that of rounding the back, and there is none which is so difficult to eradicate.

RULE 3.—*Move the limbs quietly.*

A good swimmer is at once distinguished by the ease and quietude of all his movements. The arms and legs are flung out to their fullest extent, sweep round in the water equably, and are drawn up for another stroke, without the least hurry. The bad swimmer, on the contrary, never waits long enough to make a full stroke, but gives short and hurried jerks with his arms and legs, never extending them more than half their length.

The *slow stroke* is the very essence of good swimming. Of course, we are not speaking of racing, when the strokes are necessarily quick and powerful, but merely of the method of obtaining a good and enduring style. Try how far you can go at each stroke, and do not draw back the limbs until the force of the stroke is all but exhausted. At first you will appear to make but little progress; but the endurance of the long, slow stroke is surprising, and its speed by no means contemptible.

Aids to Swimming.

The plank may be serviceable to enable the beginner to throw out his legs and feet. A piece of wood, a yard in length, two feet in breadth, and about two inches in thickness, will be found best adapted for the purpose. When the pupil can support himself, the plank being thrown into the water, he should grasp one end of it with both hands, and striking out his legs, push it on before him; but if he let go the plank, he will probably be left to sink.

The best aid to a young swimmer is a judicious friend, himself a good swimmer, who will hold up his head, when he strikes off, by the "tip of the finger to the tip of the chin," and who at the same time will show him how to strike off, and how to manage his hands and feet. It is not a bad plan to put a spar from a boat, to which a rope is attached, which the young learner may make use of by affixing it to a belt round his body under his arms, which will afford him support while he learns to strike his legs in the water. The rope may also be held in the hand of a friend, by the side of the boat, and the learner may strike off hands and feet as the boat proceeds. The plank is a dangerous aid, from its tendency to slip about, and to take the swimmer out of his depth, and although it has many advantages, is very unsafe. The safest plan of all is, for the learner to advance gradually up to his armpits in the water, and then turning about, to strike slowly out toward the shore, taking care to keep his legs well up from the bottom. Rigid perseverance in this course will in a very short time enable the youngster to feel himself afloat, and moving at "all fours,"—a delight equal to that experienced by the child who first feels that he can walk from chair to chair.

Striking off and Swimming.

In striking off, the learner, having turned himself to the shore, as before recommended, should fall toward the water gently, keeping his head and neck perfectly upright, his breast advancing forward, his chest inflated; then, withdrawing the legs from the bottom, and stretching them out, strike the arms forward in unison with the legs. The back can scarcely be too much hollowed, or the head too much thrown back, as those who do otherwise will swim with their feet too near the surface, instead of allowing them to be about a foot and a half deep in the water. The hands should be placed just in front of the breast, the fingers pointing forward and kept close together, with the thumbs to the edge of the forefingers; the hands must be made rather concave on the inside, though not so much as to diminish the size. In the stroke of the hands, they should

be carried forward to the utmost extent, taking care that they do not touch the surface of the water; they should next be swept to the side, at a distance from, but as low as, the hips; and should then be drawn up again, by bringing the arms toward the side, bending the elbows upward and the wrists downward, so as to let the hands hang down while the arms are raising them to the first attitude.

How to Manage the Legs.

The legs, which should be moved alternately with the hands, must be drawn up with the knees inward, and the soles of the feet inclined outward; and they should then be thrown backward, as widely apart from each other as possible. These motions of the hands and legs may be practised out of the water; and whilst exercising the legs, which can only be done one at a time, the learner may rest one hand on the back of a chair to steady himself, while he moves the opposite leg. When in the water, the learner must take care to draw in his breath at the instant that his hands, descending to his hips, cause his head to rise above the surface of the water; and he should exhale his breath at the moment his body is propelled forward through the action of the legs. If he does not attend precisely to these rules, he must invariably have a downward motion, and as the boys say, swim furthest where it is deepest.

Swimming under Water.

When under the water, the swimmer may either move in the usual way, or keep his hands stretched before him, which will enable him to cut the water more easily, and greatly relieve his chest. If he observes that he approaches too near the surface of the water, he must press the palms of his hands upward. If he wishes to dive to the bottom, he must turn the palms of his hands upward, striking with them repeatedly and rapidly whilst the feet are reposing; and when he has obtained a perpendicular position, he should stretch out his hands like feelers, and make the usual movement with his feet, then he will descend with great rapidity to the bottom. It is well to accustom the eyes to open themselves under the water, at least in those beds of water that admit the light, as it will enable the swimmer to ascertain the depth of water he is in.

Swimming on the Side.

In this, the body is turned either on the left or right side, while the feet perform their usual motions. The *arm from under* the shoulder stretches itself out quickly, at the same time that the feet are striking. The other arm strikes at the same time with the impelling of the feet. The hand of the latter arm begins its stroke on the level with the head. While the hand is again brought forward in a flat position, and the feet are contracted, the stretched-out hand is, while working, drawn back toward the breast, but not so much impelling as sustaining. As swimming on the side presents to the water a smaller surface than on the waist, when rapidity is required, the former is often preferable to the latter.

Swimming on the Back.

In this the swimmer turns upon his back in the water by the combined motion of the arm and leg, and extending his body, his head being in a line with it, so that the back and upper part of the head may be immersed, while the face and breast are out of the water. The hands should be placed on the thighs straight down, and the legs moved as in forward swimming, taking care that the knees do not rise above the surface in striking them out. Sometimes the hands are used after the motion of a wing or fan, by which a slight progression is also made at the same time that the surface of the body is well lifted out of the water.

Swimming on the Back without Employing the Feet.

This is twofold: 1. *In the direction of the feet.* Lie in a horizontal position, the feet stretched out stiffly, and the heels and toes in contact; then the body is to be somewhat curved at the seat, the hands are to be stretched flatly forward over the body, and, slowly striking in small circles, the loins are somewhat drawn up at each stroke 2. *In the direction of the head.* The body is placed horizontally, but somewhat curved in the seat, the head in its natural position, the arms are kept close to the body, with the elbows inclined inward, and the hands describe small circles from the back to the front, at about a foot and a half from the hips. These modes serve to exercise and strengthen the arms in an extraordinary degree without in the least fatiguing the breast.

Floating.

Lie horizontally on the back, the head bent backward as much as possible, the arms stretched out over the head in the direction of the body, the feet left to their natural position; if they sink, the loins must be kept as low as possible. In this position, the bather remains, and may float at pleasure. The lungs should be kept inflated, that the breast may be distended, and the circumference of the body augmented. In order not to sink while in the act of taking breath, which the greater specific weight of the body would effect, the breath must be quickly expelled, and as quickly drawn in again, and then retained as long as possible; for, as the back is in a flat position, the sinking, on account of the resistance of

the water, does not take place so rapidly but the quick respiration will restore the equilibrium before the water reaches the nose.

Treading Water.

This is a perpendicular position of the swimmer, and is of great use to enable him to save a person from drowning. It is in general thought to be extremely difficult, but it is very easy. There are two ways of performing the action: in the first the hands are compressed against the hips, and the feet describe their usual circle; the other mode consists in not contracting both legs at the same time, but one after the other, so that while the one remains contracted the other describes a circle. In this mode, however, the legs must not be stretched out, but the thighs are placed in a distended position, and curved as if in a half-sitting posture.

To Swim like a Dog.

In this motion each hand and foot is used alternately, as a dog uses them when swimming, as the term implies. The hands are alternately drawn toward the chin in a compressed form, and then expanded and slightly hollowed, with fingers close, and, as they strike the water, the feet are likewise drawn toward the belly, and struck backward with a kind of kick. This mode of swimming is of use to relieve the swimmer, from time to time, when going a distance.

Hand Over Hand Swimming.

In this process the right hand is lifted out of the water from behind, swung forward through the air with a kind of circular sweep, to the extent of its reach forward, then dropped into the water edgeways, and immediately turned—with the palm a little hollowed—downward, the body being at the same time thrown a little on one side, and the right leg struck out backward to its full extent. The hand descends toward the thigh, and then passes upward through the water in a kind of curve toward the surface. The left hand and leg perform a similar movement alternately with the right, and the measure of progression attained by these combined similar movements is very considerable.

Plunging and Diving.

There are two kinds of plunging; that belonging to shallow, and that belonging to deep water. In shallow-water plunging, the learner should fling himself as far forward as possible into the stream at a very oblique angle; and when he touches the water he should raise his head, keep his back hollow, and stretch his hands forward. In the deep-water plunge, his body is to descend at a greater angle; his arms are to be stretched out, his hands closed and pointed, and his body bent, so that his nose almost touches his toes.

Diving is one of the greatest amusements connected with swimming. There are many kinds; the two most common and easiest and necessary modes of going below the surface are:

1. The feet-foremost jump.
2. The head-foremost jump.

In the first, the legs, arms, and head are to be kept perfectly rigid and stiff. The pupil must not allow fear, or the strange sensation felt in the bowels in leaping from considerable heights, to induce him to spread the arms or legs, or to bend his body.

In the second mode, or head-foremost plunge—which is the safest mode for persons who are heavily built about the chest and shoulders, if they have to enter the water from heights,—the head is drawn down upon the chest, the arms stretched forward and hands closed to a point; and as soon as the swimmer feels that he has left the bank, his knees, which till then were bent, are to be stiffened. The diver must avoid striking on the belly—the general consequence of fear; and turning over so as to come down on his back or side—the consequence of pushing with the feet. When he has gone as deep as he wishes, the arms are to be raised and pressed downward.

Saving from Danger.

Above all things, the good swimmer should be anxious to save life, and to rescue those who are in danger, *without himself becoming the victim, as it often happens.* The following rules are highly important to be observed: The swimmer must avoid approaching the drowning person in front, in order that he may not be grasped by him; for whatever a drowning person seizes, he holds with convulsive force, and it is no easy matter to get disentangled from his grasp; therefore, he should seize him from behind, and let go of him immediately if the other turns toward him. His best way is to impel him before him to the shore, or to draw him behind; if the space to be passed be too great, he should seize him by the foot and drag him, turning him on his back. If the drowning person should seize him, there is no alternative for the swimmer than to drop him at once to the bottom of the water, and there to wrestle with his antagonist; the drowning man, by a kind of instinct to regain the surface, when drawn down to the bottom, usually quits his prey, particularly if the diver attacks him there with all his power.

For two swimmers the labor is easier, because they can mutually relieve each other. If the drowning person has still some presence of mind remaining, they

will then seize him, one under *one arm, and the other under the other,* and without any great effort in treading water, bring him along, with his head above water, while they enjoin him to keep himself stretched out and as much as possible without motion.

The Cramp.

The cramp generally proceeds from acidity of the bowels, arising from a bad state of the stomach, or from the effects of the cold water on the muscular system. Some persons are very subject to it on slight occasions, and such persons will do well never to go out of their depth. But should a tolerable swimmer be seized with the cramp, he should not be frightened, but the moment the cramp is felt in the foot or leg, strike out that foot or leg, with the heel elongated, and the toes drawn upward toward the shin-bone, never minding any little pain it may occasion, as he need not fear breaking a bone, muscle, or tendon. Should this not succeed, he should throw himself on his back, and float quietly, and paddle himself gently to the shore. He may also swim with his hands, like a dog, and practise any of the motions of the upper part of the body for keeping his head above water till assistance arrives.

SNOW-SHOEING.

SNOW-SHOEING is a pastime much enjoyed in the more northern sections of the country and proficiency in the art is often of real practical value. Snow-shoes are made of a single light strip of hickory or ash, the ends are bent until they meet, and then bound together for from 6 to 10 inches. Thin pieces of flat wood are fitted across the frame to strengthen it, and it is then woven with thongs or tendons, so as to make a sort of basket-work. It is from three to six feet in length, and from 12 to 20 inches wide. It is fastened to the foot by a toe-strap and two thongs that pass over the instep. The toe of the foot points toward the rounded end of the snow-shoe. The heel is left free to rise and fall, and a hole is left in the basket-work under the toe-strap, into which the wearer's toe sinks at every step. It requires much practice to attain skill in snow-shoeing. The shoe enables the walker to slip or slide over the surface of the snow with as much ease as on hard ground, the basket-work bearing the weight of a man in places where without it he would sink. The shoe should be raised a little with the toe at the beginning of the step, letting the end trail, keep head and shoulders erect, and glide the shoes one over the other. Beginners are apt to catch the toe of one shoe under the edge of the other, and so trip themselves up.

TOBOGGANING.

TOBOGGANING is one of the most ancient methods of progression and transportation in this country, and is fine sport as well. The Indians employed it for centuries and the word is of Indian origin.

The toboggan is really a sled without runners, and the frame is made of tough elastic wood about a quarter of an inch thick. They