# GYMNASTICS

AND

# BICYCLING.

# CONTENTS.

# PREFACE.

THE importance of Gymnastic Exercises is admitted by all educators and thinkers. We are weak, it has been admirably said, because it has never entered our heads that we might be strong if we would. Physical culture should hold a place, in the education of every boy and girl, co-ordinate with the culture of the mind. In fact, bodily and mental education should be pursued together, if we would so train up our youth as to secure for them all the advantages of modern science and all the benefits which belong to a sound mind in a sound body.

Believing that most previous treatises on Gymnastics have either been too learned or too simple, I have endeavoured to take the middle path, and make my instructions at once practical and comprehensive—so far, at least, as the limits of my little book would allow. I know, of my own experience, how valuable are a few well-

intentioned and plain instructions in any art or amusement; and if what I have written induces the young men of Great Britain to put aside effeminate pursuits, and practice Indian club exercises and the parallel bars, they will soon find their own profit in the exercises; and the end I seek, in putting my experiences on paper, will be fully attained.

To the present revised and enlarged edition have been added chapters on Rowing, Swimming, Cricket, &c.; so that, with Professor Harrison's "Indian Clubs, Dumb-bells," &c., we have real practical treatises on Gymnastics generally.

RAWDON CRAWLEY,
*Capt. Unattached.*

MEGATHERIUM CLUB.

# BICYCLING.

"EVERY man his own Locomotive" might almost be permitted as a title to these pages, when we consider the modern Bicycle, either in itself the acme of mechanical ingenuity, or as a means to the most healthful and varied enjoyment that the Englishman of to-day possesses. Once mounted, the independence of his nature asserts itself. By tradition, a rover, and untrammelled by Bradshaw or Cook, he experiences a new fascination on finding his "tight little island" accessible from Land's End to John O'Groat's.

But, although the Bicycle is generally brought under public notice, and its popularity has been largely accelerated

by the record of extraordinary trips and champion feats, as a practical method of locomotion it is still advancing in favor, and supplying a want that all in the enjoyment of health must at some time feel. From the letter of a gentleman recently published in *The Field*, we may infer that there are those who regard the investment in a good machine as a highly profitable speculation, the writer having accomplished on his "Tension" in three years the incredible distance of 30,000 miles, at the same time saving in railway fares, at a third-class tariff, the large sum of £125.

Treating it, however, in this pamphlet as an exercise of pleasure, its superiority for the individual athlete, must without exception be at once allowed. Independent of the caprice of others to make up a game at cricket or foot-ball, the Bicyclist, self-contained, can roam at his fancy for miles, and derive in this health-giving exercise, the benefit which such a change of air will be sure to afford.

But as our reader has probably long since arrived at the same conclusion as ourselves with regard to Bicycling, it may be opportune to caution the beginner, who may even have acquired a seat, not to be too eager in his endeavors to accomplish long distance; but rather, by frequent practice, to ensure that muscular development, without which he will be unable to obtain over his machine a complete and graceful mastery.

We now pass on to the theory of the art, and to give a few hints that are necessary to enable the novice to surmount his introductory difficulties.

Balance is the whole secret of Bicycle riding, and this is maintained by the rider's running the machine under him as soon as he feels himself falling; the performance being

analogous to the movement of a sailor, who, on finding himself lurching to one side of the deck, mechanically steps out in that direction, and thus restores his equilibrium.

Of course, practice is required to graduate the amount of movement to the inclination; but when the art is once learnt (which it may easily be in an hour), the proper amount of steering becomes as perfectly instinctive as the sailor's step above alluded to. All the learner has therefore to remember is, that when he feels he is falling, he must pull the handle on the side he is leaning to; this will run the Bicycle under him and restore his balance. For the first essay, a smooth road, a slight incline to start from, and a machine adapted to one's height are necessary.

In selecting the latter, if the learner is dependent upon his own unaided efforts, it will be as well to hire a machine of smaller dimensions than is really proportionate to his size. Upon this he will feel no anxiety at his temporary separation from *terrâ firma*, and at the same time will be enabled to obtain his first propulsion either from a kerb-stone or from the ground itself.

Having arrived at the starting point let the rider seat himself squarely in the saddle, and grasp the handles firmly, but not stiffly, with the front wheel pointing directly down hill, and in a line with the centre of his body. When he has once started, he should keep himself as much in the erect as possible; he will at first instinctively lean and bend his body when he finds himself falling; but he must get rid of this tendency as soon as he can, and trust entirely to the steering handle for restoring his equilibrium.

Having settled himself thus, he may now lift his feet, letting them hang back so as to clear the treadles, whereupon he will at once begin to move downwards; the chances

are, however, he will not run far before the machine and rider will topple over to one side. The learner will at first probably overguide himself; and by pulling the handle too sharply, turn the machine across the path and stop his progress. He must, therefore, lead back the machine, and, after taking his seat, &c., with the same care as at first, start afresh.

If the learner desires to learn quickly and properly, the rules as to carefully seating oneself every time of starting, and of not shifting the body afterwards, must be strictly observed; it is better to restore the balance by dropping the feet than leaning the body.

After about three quarters of an hour's practice, the learner will suddenly find that he can run down hill without requiring any other balancing power than that afforded by the steering-bar and its obedient servant, the driving-wheel.

When he has satisfied himself that the run is not a "fluke," and that he really possesses the secret, he may try the treadles, which he must previously have left entirely alone. For this practice a rather higher machine must be taken; so that, on using the treadles, the learner's knees are neither brought into contact with the steering-bar, nor are his arms uncomfortably stretched by the distance backward of the saddle. The start should be made as before, and when he finds he is moving pretty steadily, the learner may lift his right foot and place it on the treadle *as it is descending forward;* keeping his body *perfectly upright* during the movement. After he has followed the right treadle for a few revolutions, he may add the left foot; and he should then simply follow the treadles for about a quarter of an hour, to accustom himself to their rise and fall. The legs should be kept straight, and the feet parallel

with the driving-wheel, so that the toes may not catch its fork in passing. When he has got accustomed to keeping his feet on them, he may begin to actuate the treadles; remembering never to press a treadle until it is descending forwards, and to made his strokes as even as possible.

Pressure is made with either the arch or the ball of the foot, or the toes, according to the length of the rider's legs. As each treadle is pressed, the handle on *that* side should be held steady, so as to keep the driving-wheel straight.

In turning, large circles should be described at first; as the learner progresses, he will aid the turn by leaning the whole machine towards the centre of the circle, the effect is much more graceful.

When the learner can accomplish the foregoing, he may learn to mount properly. Of course, if the machine be low enough to admit of it, seating oneself in the saddle with the left foot on the ground and the right treadle at its highest point, raising the right foot, and pressing that treadle, and instantly repeating the process with the left foot, will start the rider; but, as the machines of the present day are seldom low enough for this movement, mounting must be performed by the use of the jump or step. To jump,—run the machine along by both handles, until an impetus is attained; and then, bringing both feet together, give a jump upwards and to the right, which will land you in the saddle. To step on the high machines; stand *over* the small hind wheel, grasp the handles, run the machine along, plant the left foot on the step, and spring into the saddle. In mounting throw *all* your weight on the handles; and remember, a hesitating mount means a fall.

For dismounting, no special directions can be given, but in the interest of the Bicycle, which should always, if

possible, retain its perpendicular, we recommend the use of the step. Some riders prefer an inelegant tumble, letting the machine come to a stand-still, and leaning over until the right foot touches the ground. Others, while in motion, raise and swing the right leg over the handle dropping off side-saddle fashion to the left.

Though the steering-bar is as it were the key of the whole machine, by the practised rider it may be temporarily dispensed with, and the balance kept by the pressure on the treadles alone. In riding side-saddle, care should be taken that the working foot keeps well on its treadle, or the result may be an awkward fall.

The leg rest, though not added by all makers, permits a very convenient change in descending hills, as the balance may at the same time be easily preserved.

The foregoing instructions will enable the learner to ride any modern machine, as they are all built on the same general principle. We may add, that in all cases the assistance of a friend is to be preferred. The first essay may then be safely made upon a Bicycle most suitable to the rider's length of limb.

With regard to the capabilities of the Bycicle, we may instance the following as the most remarkable on record:

| Miles. | Hours. | Mins. | Sec. |
|---|---|---|---|
| 1 ... ... ... ... | 0 ... | 3 ... | 9½ |
| 2 ... ... ... ... | 0 ... | 7 ... | 4½ |
| 4 ... ... ... ... | 0 ... | 13 ... | 21 |
| 6 less 125 yards ... | 0 ... | 22 ... | 6½ |
| 10 ... ... ... ... | 0 ... | 35 ... | 30 |
| 20 ... ... ... ... | 1 ... | 17 ... | 16¼ |
| 50 ... ... ... ... | 3 ... | 9 ... | 19 |
| 106 ... ... ... ... | 7 ... | 58 ... | 54½ |

In selecting a Bicycle the purchaser should be very careful to look, not so much to the cost as to the quality of the machine. He should never buy except from a well-known maker, and then only the best. In the first place an inferior Bicycle is dangerous to life and limb; and secondly, it is all but unmarketable if at any time it is desirous to sell it. When we consider the weight that a few pounds of metal has to bear, and the distance the machine will probably be required to travel, it is impossible that any but the very best materials can stand the constant strain; and although a Bicycle to look at seems very easy of construction, yet, to the initiated, it is evident there are parts in it which ought to be made by very special tools, requiring the greatest skill of the mechanic for their production. The possession of these tools implies the expenditure of a large amount of capital, and therefore it is hardly to be wondered at that there are so few makers capable of turning out a machine which will last for any length of time. It seems invidious to mention names, but our readers will know our advice is unprejudiced and impartial; and we have public opinion at our back when we say—the oldest and largest firm in the kingdom is the "Coventry Machinist Company," Coventry, and that their Bicycles have a very high reputation. The Cambridge University Bicycle Club, numbering about 120 riders, use this make almost exclusively, and a higher recommendation it seems impossible to have. This Company have lately opened London Offices on the Holborn Viaduct, where there is a large and elegant saloon in which purchasers are taught the use of the Bicycle free of charge.

The following table, showing the height of wheel suitable to the length of leg, will be of assistance to the purchaser.

The measurement must be made inside, and down to the sole of the foot:

| Diameter of Front wheel. | Length of Leg. |
|---|---|
| 42 inches ... ... ... ... ... | 30 inches |
| 44 „ ... ... ... ... ... | 31 „ |
| 46 „ ... ... ... ... ... | 32 „ |
| 48 „ ... ... ... ... ... | 33 „ |
| 50 „ ... ... ... ... ... | 34 „ |
| 52 „ ... ... ... ... ... | 35 „ |
| 54 „ ... ... ... ... ... | 36 „ |
| 55 „ ... ... ... ... ... | 37 „ |
| 58 „ ... ... ... ... ... | 38 „ |
| 60 „ ... .. ... ... ... | 39 „ |

The prices vary according to size, and for a good machine will range from £12 to £15.

We will now proceed to the main object of this little manual, viz.:—

# GYMNASTICS.

## TRAINING.

THE rationale of Training is to nourish the body as rapidly as possible, and at the same time to get rid of the waste material. It may be compared, by way of illustration, to the rapid consumption of fuel in locomotive engines by a quick draught of air, and the production of steam from an immense extent of heated surface, obtained by exposing to the fire many tubes filled with water. The best fuel is supplied to

the man or boy in training in the shape of bread and water. His smoke and cinders must be got rid of rapidly, so as to excite the fierce combustion demanded for the pace he has to go, and the long-continued efforts he has to make. To accomplish this, the fire-grate and chimneys of the human engine must be kept clear and in perfect working order. The skin, which lets off the waste steam and smoke at millions of pores —or say twenty-eight miles of tubing, for this has been calculated—is of the first importance; hence, by long experience, from the Greeks and Romans to our day, trainers, who are no great physiologists, have paid the closest attention to the skin, whether in training horses or men. The Greeks used a scraper called a *strigil*, and they sometimes rolled in the dust after anointing, all of which compelled them to use a great amount of friction in merely cleansing the skin. Perspiration is excited and kept up at regular intervals; and the pores are cleansed by rubbing with hard brushes and towels, with occasional sponging, though the bath is used sparingly. By this means also the circulation of the blood in the minute network of vessels all over the body is assisted. Men in ordinary health get rid of about three pounds of water alone from their skin daily, but in training it is much more than this. Then the lungs, being nearer to the central furnace of the body, are of even more importance to be kept at work than the skin; for from them the chief part of the smoke must be got rid of, besides a good deal of steam, or, in other words, carbonic-acid gas and watery vapour. In ordinary good health a man expires about twenty-one ounces of steam daily: of course a man undergoing great exertion breathes off much more than this. Then the light fresh air is exchanged in breathing for the heavy carbonic gas, ammonia, hydrogen gas, and volatile animal substances, making altogether from six to eight per cent. of effete material got rid of by the lungs. Now we can see the necessity for a man having what is called "good wind:" his lungs must be able to bear, without distress, the constant and rapid contraction and expansion, and the strong action of the heart in driving on the vital

stream. Hence no person with a weak chest should attempt to train severely, though the regimen, very moderately and gradually applied, would certainly be beneficial; for it may then simply embrace the well-known precepts of fresh air, exercise, simple food, no excesses, and early hours. Those are favoured by Nature who can endure exercise occasionally as severe as that gone through by pugilists and rowing-men. By it the lungs are ventilated as they cannot be in ordinary exercise, and the high vigour of the system is maintained. In quiet breathing, as much as 170 cubic inches of air remain in the chest, while about 25 inches are expired; but by violent exercise this is raised to 240 cubic inches, and renewed at the rate of from forty to fifty times in a minute.

The dietary of the trainers is open to criticism upon some points. They prescribe a dry meat diet, on the supposition that it makes the flesh firm, and keeps the blood from being watery. This is an error; for we know that the strongest men are composed of as much water as other men, and that this apparently idle and harmless fluid is a most vital one, for it forms no less than seventy per cent. of the whole body. The muscles would be mere shreds if deprived of their water; and the singular thing is that this is not easy to accomplish even in dead muscle, for the water is not contained as if by a sponge—it cannot be pressed out of the flesh except by a weight which destroys the fibre; water therefore is an essential constituent of muscle. The nerves, which are really the source of all muscular energy, actually consist of 800 parts water in 1,000. Old Thales was not far out when he taught his pupils that water was the life of all creation. It is possible to live for some time on water alone; but when entirely deprived of it death soon results. The trainers are right, however, as to not taking liquids in large draughts: this is prejudicial to digestion, and is liable to produce a dangerous chill or shock. It is not advantageous that thirst, which arises from all violent exercises, should not be quenched; but this should be done by small quantities taken while the system is heated, and not by large draughts immediately after

the exertion is over. Water is by far the best beverage to be taken during any strong exercise, as in long walks over hilly ground in hot weather, and in any of the more arduous feats of running and walking. Tea, if taken cool, is, however, a very light and stimulating drink; but beer, most wines, and spirits are injurious to all great efforts. A diet of lean meat and bread, with scanty vegetables, is decidedly not favourable to robust health; experience has long taught us to follow the inclination for varieties of many kinds; and perfect condition, even to efficient Training, may be kept up by partaking of these, always excepting young meats and veal, which is not only immature, but half diseased, from the process of daily bleeding which is adopted to produce the appearance of delicacy. A diet in which flesh is the chief article is indispensable to our climate and our habits. The consumption of meat in England is three times that of France; and it has been proved that one English navvy did the work of two and a half French navvies—until the contractor fed up his Frenchmen, when they nearly equalled their rivals. But flesh-feeding is easily carried too far, and tends to overload the blood with phosphoric acid and alkalies—earth, in fact. There is this important piece of encouragement in favour of adopting a regular system of exercises, that when the body is in perfect working order the digestion partakes so completely of the general high tone that nothing can resist it—a man becomes "as hard as nails," and rejoices in having the stomach of an ostrich. Let him get "out of condition," and he is choice and sensitive upon a hundred points, each one a misery to him. The pugilist is not to be considered so good a representative man as the navvy, because he is kept in a state of high tension, which cannot last, and which is gladly escaped from; while the navvy is merely in the highest working condition. The death of Tom Sayers from consumption, at the early age of forty, is a proof that severe Training is not the best thing to preserve a good general state of health; but then it must be recollected that men of the Sayers class indulge greatly immediately

after their period of Training expires. We are not all born navvies; but there is nothing to hinder us attaining the full physical capabilities with which Nature has endowed us, each in his measure.

No matter how intellectual the calibre, or how sensitive the fibre, material health lies at the root of all. If Gymnastics were esteemed with us as important as they were with the ancients, and practised habitually as by them, there is no doubt that the public health would be raised, and new fields of enjoyment would open out to the multitude who are always wondering what ails them, or what on earth they can find to do. Among the Greeks, philosopher, physician, and gymnast were united in one person. Galen, in his thirty-fifth year, dislocated his shoulder when wrestling. The *aliptæ*, who superintended the diet and training, became reputed physicians; and their cure of diseases consisted almost entirely in adopting some of the processes of training in use in the *palæstræ*, the places built for the separate use of the *athletæ*—the professional strong men, distinguished from the *agonistæ*, or amateurs. Every town of importance had its gymnasium; and here poets came to recite, philosophers to dispute, and the fashionable public to look on at the exercises and to gossip. The great contests were in running, jumping, leaping with weights in the hands (*halteres*), boxing, wrestling, throwing the *discus* (a sort of quoit-play), and hurling the spear. All these were practised also by boys; and they had a favourite game of pulling a rope against one another, something like our "French and English"—a game which to this day is practised on a large scale in Shropshire, where on Shrove Tuesday the different wards of Ludlow pull upon a long rope for the mastery. The use of the bath, with friction of the skin and Gymnastic Exercises, was the custom; and most houses had their *palæstræ*, which were richly adorned with works of art. The Roman boys were not trained as the children of the Greeks were, and Gymnastics were certainly not so rigidly practised for their own sake: the Romans preferred the magnificence and display of the circus and the amphitheatre.

Let us now examine the various methods employed to reduce these theories into practice—to illustrate, in fact, the rationale of Training by the practice of Gymnastics.

## EXERCISES WITHOUT IMPLEMENTS.

It is important in beginning Gymnastic Exercises that the pupil should carry himeslf well. In commencing, standin the First Position, the heels in a line with each other, and as

FIRST POSITION.

close together as possible ; toes open, and legs straight without stiffness ; body perpendicular ; shoulders thrown back, and head erect ; hands closed and nearly touching the hips, with the fingers turned to the front ; eyes looking straight forward. The scholars, when standing in this position, practise various elementary movements ; such as turning the head to the right

and to the left, alternately; and then turning the head forward and backward. But care must be taken not to tire the limbs.

There are a large number of exercises which are executed without moving from the spot stood on, and whose object is to render the legs and arms supple. It will suffice to quote some of these. Thus, for exercising the legs and lower extremities, lift the left foot off the ground, and raise the knee as high as possible (during this movement that

EXERCISING THE LEGS.

portion of the leg between the knee and the ankle is vertically placed, the point of the foot slanted); put your foot on the ground in the same position as it was just now, and execute the same movement with the right leg as we have just described for the left. This exercise is practised alternately with the two legs, at first slowly, then quicker, and

continues for a more or less prolonged period. During this exercise the head remains erect, and the body inclines a little to the front ; the arms hanging down, the hands closed.

For exercising the arms and upper extremities, raise the closed hands above the head as high as possible, the fingers to the front, then bring them sharply down, bending them at the elbow, giving them a motion which brings them (the elbows) to the top of the hips, and continue thus the same movements. In order to move the arms horizontally, place the wrists, with the fingers uppermost, on a level with the elbows, and preserve between the wrists the same distance as the width of the shoulders ; then throw the wrists straight out, bring the elbows back, and continue thus the movement. Lastly, the continued and alternate movement of the arms is executed in the following manner : — First, carry the right arm stretched out to its full extent behind the body, the hand closed ; bring it then to the front, and throw it round and round parallel to the body, describing with the fist the greatest possible circle, without ever bending the arm, and throwing it round as quickly as possible. After having executed this movement a certain number of times, bring the arm to the front and then throw it round behind, repeating it as many times as you did before. It is simply the same movement made in a contrary direction. The left arm will in its turn perform the same exercise.

The PYRRHIC EXERCISES tend still more to strengthen and make supple the legs and arms. If it is a question of carrying the extremities in advance of the body, it is necessary to lunge out straight before oneself the right leg in advance, and stretching out vigorously with the right arm in the same direction as the right leg, the hand closed, the right leg bent, the left straight out behind, the left arm detached from the hip, the thumb of the left hand in the air, the head upright ; then bring the right extremities back again in such a manner that the right heel touches, or very nearly so, the middle of the left foot, and the right arm is close to the side, and as far behind as possible.

But as the pupil cannot always maintain his equilibrium for any length of time, the whole of his weight being on his left foot, he lunges out again, by throwing his wrist vigorously out in front. This exercise is practised in the same manner by his left extremities.

The bending of the lower limbs is also a very useful exercise. In order to put yourself in position, place your toes about three or four inches apart, and at the same time put your hands upon your hips, the fingers in front and the thumb behind, thus:—

THE STOOP.

This is called the *Stoop*. Bend the knees together, and rise; then bend down again, and rise again. At the first attempt you should not bend down too low, the second may be a little lower, and at the third or fourth attempt the heels should touch the top of the hips. During this series of movements the head should be well poised, so as to be always in the centre of the body. This retention of the trunk in an upright position is of the greatest importance in Gymnastic Exercises.

## Jumping.

There are many ways of Jumping: I shall only describe the most important—that is to say, those which are the most usually practised in Gymnastic Exercises, and which are often put in practice in the course of every man's life. Such are the Wide or Horizontal Jump, the Vertical Jump, and the High Jump.

THE WIDE JUMP.

THE WIDE JUMP.—In order to jump a distance on the bare ground, or over a ditch, brook, &c., close-footed, and without any preliminary run whatever, the jumper places his two feet close together, then he bends down, throws his closed hands to the front to a level with his shoulders, and the same distance apart as the width of the latter; he repeats the same movement a second and a third time, but the last time he presses his feet firmly on the ground, and by a quick and vigorous bending action of his arms and legs he springs, clears the space,

and comes down upon the tips of his toes. It is important to bend the legs at the moment when you touch the ground, so as to break the shock produced by the weight of the body falling on them. In practising this exercise the pupil should at first jump short distances, to enable him to preserve the equilibrium of the body, and to acquire the necessary suppleness little by little. Exaggerated efforts only have bad results.

JUMPING FROM A HEIGHT.—This is a very useful, but at the

JUMPING FROM A HEIGHT.

same time a somewhat difficult exercise, not to be performed without danger if sufficient precautions be not taken. This jump should first be practised from rather low elevations; then by degrees the jumper may extend the distance until he is able to jump from a tolerable height. In fact he should never jump from a great height until he has first learned to

master the principles of jumping from lower elevations. This is how this exercise is performed :—Once placed at the height from where you wish to jump, clench the hands, place the feet together, and let them project a few inches over the bank, or whatever else you are about to jump from ; then bend down to the feet, carrying at the same instant the hands up as far as possible. Practise this movement twice ; at the third time the feet leave the spot on which you are standing, and you fly over the space by throwing yourself up in the air ;

THE HIGH JUMP.

the legs are in a straight line with the body, so as to execute the bending movement at the very moment when the feet touch the ground. At this movement the hands are elevated, and as you come to the ground you bend the knees and fall forward on your hands, in order to break the shock. But of

course this only applies to severe jumps. Where the distance is small you can come down on your feet without any great shock.

THE HIGH JUMP.—For the High Jump—that is, jumping from a lower to a higher platform—it is necessary to close the hands, and place the feet together; then bend the knees, throwing out the arms in the direction you are about to jump. After having practised these movements two or three times, you execute those already described for the wide jump. The force of the bend of the legs should be always sharp and sudden, and in proportion to the height to be jumped.

THE RUNNING JUMP.—Brace yourself well up, take a sharp run, and make your jump without fear or hesitation, increasing the distance jumped with each trial. A man *ought* to be always able to jump a distance nearly equal to his own height; and, with a little practice, every healthy young man *can*. But the practice must be taken gradually and regularly, with sufficient training.

## Walking and Running.

WALKING is the most simple and the most natural exercise possible. To walk is to cause an alternate movement of the legs. The point of the toe is slightly turned out; the thighs are held without stiffness; the upper part of the body is kept steady, and a little in advance; the arms fall naturally, without any contraction of the muscles, with an alternate movement of the right and left arms to the front.

In Walking the weight of the body rests on one foot while the other is advanced; it is then thrown upon the advanced foot while the other is brought forward; and so on in succession. Thus we see that we always rest on one foot in the process of Walking. In this mode of progression the equal distribution of motion is such that many muscles are employed in a greater or less degree, each acts in unison with the rest, and the whole remain compact and united.

Hence the time of its movements may be quicker or slower without deranging the union of the parts or the equilibrium of the whole. It is owing to these circumstances that Walking displays so much of the character of the walker—that it is light and gay in women and children, steady and grave in men or elderly persons, irregular in the nervous and irritable, measured in the affected and formal, brisk in the sanguine, heavy in the phlegmatic, and proud or humble, bold or timid, and so on, in strict correspondence with individual character. A firm yet easy and graceful walk is by no means common. There are few men who walk well if they have not learned to regulate their motions by the lessons of a master; and this instruction is still more necessary for ladies. Walking may be performed in three different times—slow, moderate, or quick—each pace somewhat modifying its action.

THE SLOW WALK OR MARCH.—In this the weight of the body is advanced from the heel to the instep, and the toes are most turned out. This being done, one foot, the left for instance, is advanced, with the knee straight and the toe inclined to the ground, which it touches after the heel. The right foot is then immediately raised and similarly advanced, inclined, and brought to the ground; and so on in succession.

THE MODERATE PACE.—Here the weight of the body is advanced from the heel to the ball of the foot; the toes are turned well out, and it is the heel of the foot which first touches and first leaves the ground. In this step less of the foot may be said actively to cover the ground; and this adoption of nearer and stronger aids of support and action is essential to the increased quickness and exertion of the pace. The mechanism of this fact has not been sufficiently attended to. People pass from a slow march to the quick pace they know not how, hence the awkwardness and embarrassment of their walk when their pace becomes moderate, and the misery they endure when, for instance, this pace has to be performed by them, unaccompanied.

THE QUICK PACE.—Here the weight of the body is advanced

from the heel to the toes, the toes are least turned out, and still nearer and stronger points of support and action are chosen. The outer edge of the heel first touches the ground, and the sole of the foot projects the weight. It is important to remark, as to all these paces, that the weight is successively more thrown forward, and the toes are successively less turned out. In the general walking of ladies the foot should be put forward without stiffness, in about the fourth dancing position, and without any effort to turn the foot out, as it throws the body awry. The arms should fall in their natural position, and all their movements and oppositions to the feet should be easy and unconstrained; and the pace should be neither too slow nor too quick. The gait should be in harmony with the person, natural and tranquil, without giving the appearance of difficulty in advancing; and active, without the appearance of being in a hurry.

In regular Walking each step should be equal in length and speed. In quick Walking the pace can be gradually increased from 70 or 80 to 100 or 110 steps a minute. Five miles an hour is considered excellent Walking, though many professional pedestrians can accomplish seven, or even more. In April, 1873, Mr. W. J. Morgan walked seven miles in the splendid time of 54 minutes 56 seconds. This feat was performed at the Amateur Championship Meeting at the Lillie Bridge Grounds, West Brompton, and is by more than half a minute the shortest time in which seven miles has been walked by an amateur.

The GYMNASTIC STEP requires more force and suppleness than the ordinary step. It is executed by raising the leg in such a manner that the thigh is horizontal and the leg vertical, the point of the foot being held very low. The Gymnastic Step is difficult and punishing at the commencement, but, with custom, it very soon ceases to fatigue you more than the ordinary step, and more completely exercises the muscles. Practised on inclined planes, it requires a muscular action more considerable than when it takes place on horizontal ground. If you ascend a hill the effort is made in a direction

directly opposed to the general tendency of the body's gravity. The body is curved, the upper part a little in advance ; the action of the muscles of the leg and thigh is considerable ; the circulation of the blood and the respiration are accelerated by the violence of the muscular contractions. If you descend a hill it is just the reverse. The effort consists in holding up the body, which has a tendency to fall forward, and it is in order to moderate this tendency that you endeavour to throw forward your legs and hold back the upper part of your body ; the knees rather bent, the heels touching the ground, and the paces rather short. You must, in one word, assimilate, as it were, the action of the legs to that of the sticks of which travellers make use in mountainous countries. This kind of walking not only acts on the muscles, but exercises a beneficial influence on all the organs and functions of the body.

In order to WALK BACKWARDS it is necessary to incline the upper part of the body a little back. The weight should principally be borne on the right leg ; the left leg, being raised and carried behind, touches the ground with the point of the foot first. Crossing the legs should be avoided.

RUNNING.—*Foot-racing* is a very important exercise, and one of the most difficult to sustain, if it is a question of rapidly running over a long distance. It is, however, only a very natural movement applied to the legs, and, backed by a firm will, the runner should be able to maintain it for a time more or less long. That which is the most fatiguing in running is not precisely the movement of the legs. Once that you have rushed forward, the body is carried in advance by virtue of the force acquired by the run ; the legs have, so to speak, nothing else to do than to maintain the equilibrium, and prevent the body from falling, as this often occurs if the foot strikes against any object on the ground.

The greatest difficulty to overcome in impetuous and sustained Running is to accustom the chest to support the violent exercise to which it is subject. When you run a current of air always flies into the lungs, the blood circulates more

quickly, respiration becomes more frequent, and the warmth of the body rapidly increases. But, by exercising yourself by degrees, you are not very long in accustoming yourself to this superabundance of air, and in a very little time the pressure on the chest and stomach almost dies away. You learn how to nurse, as it were, your strength at the commencement of your run. Accustom yourself to take regular paces, and you

RUNNING.

will be able to run over a very considerable distance. It is considered a good run to cover a mile in five minutes; but there are very few, even among the professional runners, who can do eleven miles in an hour. I have myself accomplished ten miles within the hour, but I should find it difficult now to run six. Mills, Richards, Lang, and McKinstrie, the Scottish champion, have in their time accomplished great feats. Deerfoot, the so-called American Indian, was beaten by White,

of Gateshead, in a ten-mile race at Hackney Wick. Mills ran a mile in 4 minutes 20 seconds, which, until August, 1865, was the fastest mile run upon record. Lang and Richards, on the 19th of August, 1865, accomplished the extraordinary feat of running a dead heat in 4 minutes 17¼ seconds; but the year before, Lang ran a mile, down-hill, in 4 minutes 2 seconds, the fastest run ever known. This took place at Newmarket. In June, 1864, Mills ran a mile at the Royal Oak Park, Manchester, in 4 minutes 21 seconds, beating Lang by 12 inches. McKinstrie ran half a mile in the wonderfully short space of 1 minute 58 seconds, in 1865, at Manchester; and Albison ran a mile at the Copenhagen Ground, Manchester, in 4 minutes 22 seconds. Amateur runners now very nearly approach these times. Mr. J. Scott, of the London Athletic Club, has run a mile in 4 minutes 32 seconds, and four miles in 21½ minutes. In the Oxford and Cambridge Inter-University Sports, 1873, the mile race was run in the shortest amateur time on record—4 minutes 28 seconds; this being only 10⅝ seconds—or about 60 or 70 yards in the mile—slower than the best professional time.

And now as to the *practical art of Running.* The forearms and wrists are carried quickly and alternately to the front, in such a manner that the left arm moves with the right leg, and the right arm with the left leg. The heel scarcely touches the ground, to give to the step the necessary quickness and elasticity; the body, inclined forward, progresses without any movement of itself; the head is carried a little forward. The most perfect uniformity should exist in the movements of the upper and lower extremities.

FOOT-RACES, in which it is a question of covering at the greatest speed a certain distance, are exercises which require that you should run in a very progressive and at the same time in a very cautious manner, as much for duration as for speed. They demand, also, certain precautions which should never be neglected. "I recommend you expressly," says an able gymnastic professor, "never to undertake long distances, unless you immediately afterwards enter a chamber or closed

apartment, free from draughts of air. It is necessary to change the shirt, and, if need be, all the clothes, so as to avoid a crowd of little indispositions which generally come on through wearing damp or wet linen." The walker should be lightly dressed, and should wear shoes or slippers, without pressure on the ankles; he should also be furnished with a belt, which should sustain the chest and lower part of the stomach. But he must not girt himself too tightly, for all his movements should be free. Long courses should not take place before three or four o'clock in the afternoon, or at least not till some time after meals, and in a good temperature.

THE RUNNING JUMP.—I have already shown the manner of jumping without a run; but you can jump also in running, and here is the way in which it is done:—Taking his position preparatory to running, and starting off, the runner arrives at the point over which he is to jump; he then quits the ground by vigorously pressing it with the foot which, at that very moment, was in advance of the other; at the same time throwing his hands to the height of his shoulders, and in the same direction as that which he is about to take, he jumps over the space, reaches the ground in bending his lower extremities, and becomes upright again. These principles apply equally to the high jump, with this difference only, that in the second case the hands should be in front, in the same direction as that which the body takes to leap over the obstacle.

There are two essential rules to be observed in the Running Jump: when the jumper throws himself forward he must employ all his vigour, so as to make abound as far as possible; when he has thrown himself forward he must employ all his activity, in order to fall as softly as possible. If he fall on his heels, all the body receives a great shock; the brain strikes against the bones which surround it, which may often result in injuries to the head. If he fall too much on his toes, he may, perhaps, sprain them. It is necessary, then, to contrive so as to fall on the sole or ball of the foot, and only to let the heel touch the ground afterwards.

When you jump only a short distance you sometimes fall, especially if the ground is at all uneven; that is because you have not jumped high enough. It is necessary, then, when you make your spring, to do it in such a manner that at the moment when you fall to the ground your feet should be able to rest squarely on the soil. If you do not jump high enough you find yourself ricochetting like the stones with which children amuse themselves by throwing to skim on the water. But ricochets are no amusement for the jumper, who sometimes rises from the ground with a bruise on his face, or with grazed hands and arms.

## EXERCISES WITH IMPLEMENTS.

Amongst the Gymnastic Exercises which may be executed with the aid of Portable Implements, we shall choose those which appear to us to give to the body the greatest suppleness and vigour.

### Pole-leaping.

The pole which is used for this exercise should be of sound ash, rounded throughout its length, which should be in proportion to the height of the jumper and the space to be jumped over. It is advisable to practise this kind of jumping at first without a run. For this purpose he who is about to jump fixes the end of the pole into the ground in front of him, at a distance which may be gradually increased with the efforts of the jumper; then he seizes the pole with his two hands—the top one a little above his head, and the lower one a little above the level of his hips. He springs off equally with both feet, throwing most of his weight upon his arms, and pushing himself forward as far as possible by bearing on the pole, which he then slackens, and falls to the ground, observing the same principles we have already pointed out. In order to jump over a space with a run, he places himself at a

certain distance from the space over which he is to leap, and after having seized the pole with his right hand a little above his head (the thumb in the air), and with his left hand a little above his thighs (the thumb downwards), he starts forward, holding the lower end of the pole in front of him. Arrived at the edge of the ditch, or whatever it may be, over which he is to leap, he sticks the pole in the ground before

POLE-LEAPING.

him, then, by a sudden and active effort, he raises his body, bearing his hands on the pole in such a manner as to turn it from the right-hand side to the left, and leaps the space, the body being nearly in a horizontal position; he then reaches the ground by bending on the joints of the legs. The pole-leaper should at first practise at short distances, which he can gradually increase.

## Dumb-bells.

These instruments were used by the ancients in their Gymnastics. Two masses of iron, generally spherical, united by a short wooden or iron rod, which the hand easily clasps, constitute the Dumb-bells: by means of these you can execute a multitude of varied exercises. The most simple of these exercises consists in alternately bringing the dumb-bells to the front and raising them to the height of the shoulder.

DUMB-BELLS.

To effect this, you hold at first the dumb-bell in your hand close to your thigh, remaining for a moment in this position. Then you raise the dumb-bells before you with jerking till they reach your shoulders, then bring them back again to the first position. Do this first with one arm and then with the other. In order to simultaneously raise the dumb-bells in front to the height of the shoulders, you hold them in the

manner already described—that is to say, with the hands close to the thighs—then raise them both at the same time until they are on a level with the shoulders, and bring them back again. Repeat this exercise continually. Other methods teach you to raise the dumb-bells alternately and simultaneously to the right and left, to the height of the shoulders ; to hold the dumb-bells straight out before you, and then to raise them up high ; to hold the dumb-bells for a time with the arms stretched out as horizontal as possible; to imitate the boxer's motions, &c.

## Indian Clubs.

The exercises with the Indian Clubs are of a more recent date than those with dumb-bells. They were introduced into Europe by a military officer, who had seen the Persians exercise with them. These exercises are performed alternately with the two hands, and sometimes simultaneously, with two instruments of a massive conical form, which in Persia are called *nulo,* and in India *mugdaughs.* They are very useful for increasing the muscular power of the arms and shoulders, opening the chest, and strengthening the hands and wrists. They have also the advantage of rendering the player with them ambidextrous, or two-handed—that is to say, of making the left hand as able and vigorous as the right, and enabling him to use one as readily as the other. As instruments of exercise they are as fitted for women and girls as for men and boys. Gracefully used, they give a good carriage and deportment, not always obtained by other means. Dumb-bell practice should precede the use of the Indian clubs. In beginning with the latter, take off your coat and cravat, loosen your braces and waistcoat, and put on a belt. Thus you will be free in all your movements.

The most simple exercises with the Indian clubs consist in carrying them to the shoulder, sometimes with the right arm, sometimes with the left—in carrying the club before and behind, to the left and to the right. In the more difficult exercises you move the clubs alternately around the body,

seizing them at first by the hand, and holding them parallel to the legs, the arms held down without stiffness, the clubs in a straight line with them. Then raise the right club, without the slightest jerk, in front and near to the body in the direction of the left shoulder, until the fore-arm passes the head, the club always remaining vertical. Then continue to pass the club behind the body, bringing it towards the right

INDIAN CLUBS.

shoulder, and letting it gradually descend to the ground. The same movement is repeated with the left club, by commencing to raise it towards the right shoulder, and so on continually. Practise all the movements slowly ; but when you have once familiarized yourself with the exercises you may execute them more quickly, always taking care that one club descends while the other ascends.

[For further instructions in Dumb-bell and Indian Club

Exercises, I would refer you to Professor Harrison's able treatise in the CHAMPION HANDBOOK series. The subject is too important to be dismissed in the few remarks which the limit of this little volume enables me to make.]

## The Iron Bar.

Exercise with the Iron Bar develops all parts of the body. The exercise consists in twirling and throwing the bar the

THE IRON BAR.

greatest distance. Any number of persons can engage in the contest, and it is no small feat to prove a victor in the sport. The weight of the bar should be in proportion to the strength of the player. This is the way in which it is played:—The competitor seizes the bar in the middle with his right hand, and brings his left foot in advance in such a manner as to allow it to firmly rest on his left leg. He then throws his right arm as far behind him as he can, the bar resting in a

vertical position, and the left arm stretched out a little to the front. In this position he brings the bar straight in front of him, making it describe a horizontal half-circle, and holding it always vertical. He will then throw it back again, and bring it a second time to the front. Lastly, he will throw it back again a third time ; and this time he will hurl it with all his force, relinquishing his hold of it as soon as it arrives in front, in such a manner that it shall while flying along preserve its vertical position and fall endways on the ground. The greatest difficulty in this movement consists in maintaining the bar in a vertical position when it is thrown, while endeavouring to make it fly as far as possible.

## EXERCISES WITH FIXED AUXILIARIES.

The Gymnastic Exercises which can be executed with the aid of Fixed Auxiliaries are as numerous as they are varied. The detailed description of all these would of themselves occupy a volume ; I shall therefore only describe those which are most commonly practised in gymnasiums and play-grounds.

### The Suspension Bar.

The exercises with the Suspension Bar are very useful, on account of the considerable development which they give to the muscular power of the chest. With perseverance and a wise gradation, they always produce the best results. The most simple exercise consists in suspending yourself by the hands, simultaneously and alternatively—that is to say, at first by both hands at the same time, then by the right hand only, then by the left hand only; the arms and the body always being stretched out at full length, the feet close together, the legs hanging down, and the head upright. There are various exercises which can be executed by means of the suspension bar—to raise the head above the bar by strength of the arms ; to hang by the bend of the arm, and by the bend

of the knees and the arms ; to hang by the hands and advance to the left or to the right, hand over hand ; to hang by

THE SUSPENSION BAR.

the hands and jerk yourself to the right or to the left, &c. All these will soon become familiar to the amateur athlete.

## The Ladder.

The first exercises practised by aid of the wooden Ladder do not offer any very serious difficulties. They consist of ascending and descending a ladder with the aid of the legs and

hands, with the face turned to the ladder; and of ascending and descending with the aid of the legs and hands, with the back turned to the ladder. Then come the exercises a little more difficult; for example, ascending the ladder with the aid of the feet only, and descending by sliding down the ladder. In order to perform this exercise it is necessary, after having placed yourself before the ladder, the face to it, to put the

THE LADDER.

left foot on the first round without touching the ladder at all with the hands; to incline the upper part of the body a little forward, and raise the arms, bending them in such a manner as to preserve the equilibrium of the body. This position once taken, you raise the body by straightening the left leg; the right leg is then brought on to the upper round, and you continue thus as far as the top of the ladder. Once arrived

there, it is necessary to seize the uprights tightly with the hands, bending the arms a little, and then to twist the right foot round to the back of the right upright, and the left round to the back of the left upright. Each of the two hands clasps one of the uprights; and then you slacken the hold of the legs and hands and slide to the ground.

The principal and the best exercises, which can still be progressively executed, are the following: to ascend the rounds and to descend them, by placing the hands, one after the other, on the same round; to ascend the rounds and to descend them, by placing the hands, one after the other, on a different round; to ascend the rounds and to descend them, by jerks; to ascend and descend by the two uprights, by jerks; lastly, to pass from the front of the ladder to the back, and *vice versâ*.

## Ropes and Poles.

These exercises are excellent aids to strength and agility. Let me first point out the way to ascend and descend a KNOTTED ROPE. Lay hold of the rope as high up as you can, the hands one below the other, and close together; raise the body by strength of arm, the heels both together, and the legs hanging down; turn the feet round one of the knots, which will form a kind of rest for the body; then seize the rope higher up; and with these alternate movements of the hands and feet the body at last reaches the top of the rope. During these exercises you should avoid jerks and shocks. You descend the knotted rope by inverting the order of ascent.

TO CLIMB THE NAKED ROPE is a little more difficult. It is necessary to grasp the rope with the right leg, by making it pass outside the leg from right to left, and in such a manner that the rope in turning round the leg presses against the calf and passes under the knee-joint. In order to get a point of support, you seize the rope with your hands, somewhat high up, and raise the body by making an effort of the arms

—that is to say, pulling yourself up—and letting the rope slip between your legs; then as you press the rope again with your feet you are prevented from slipping down again. These alternate movements of the hands and feet bring the climber to the top of the rope. In order to *descend*, let the rope slip between your legs, bringing the hands down alternately, one beneath the other.

CLIMBING THE ROPE.

To Climb a Mast or Pole, you should grasp it with the hands as high as you can, the arms stretched round it, and the body upright; then press the front of the mast tightly with your legs, at the inside of the right knee and the front of the right foot, while you keep the left tightly against the back of the mast, and raise your body by pulling yourself

up by the arms, at the same time working with your legs. In order to *descend*, place your hands alternately to the height of your waistband, and then glide gently to the ground. The same principles are followed in climbing or descending a swinging pole. It is not very difficult to climb two parallel

CLIMBING THE POLE.

poles at the same time, supposing them to be not more than two or three feet apart. You must alternately pull yourself by each arm, keeping the legs close together, and taking care to lower the toes, so as to deaden the shock if you fall to the ground. The *descent* is made by reversing the mode described, the principle being precisely the same.

## The Trapeze.

FIRST EXERCISE.

Exercises on the Trapéze offer a series of important movements for the development of the chest, at the same time contributing to strengthen the wrist and shoulders; they also accustom you to holding the head downwards without feeling inconvenience or giddiness. These exercises cannot be fully taught in books: by practice only can excellence in them be acquired. It will be sufficient to describe the most ordinary exercises on the trapéze; all the rest will come with practice under the direction of an intelligent professor.

*First Exercise.*—Place yourself under the trapéze, with the legs close together, raise your hands, seize the cross-bar at the width of your shoulders, and raise yourself by shortening the

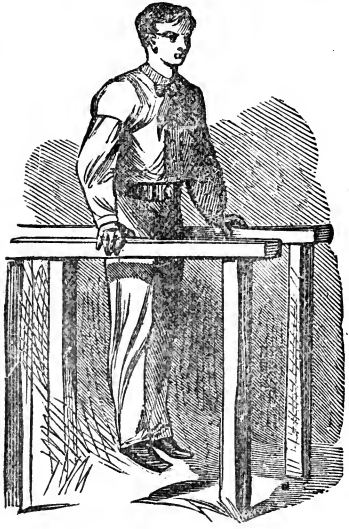
arms and bringing the chin to a level with the bar of the trapéze ; then still farther raise yourself, and at the same time incline your body forward in such a manner that it rests on the cross-bar, but the principal weight being on the arms. Swing backwards and forwards in this position.

*Second Exercise.*—Place yourself under the trapéze ; seize the cross-bar as before, placing the two hands on it at the

TRAPEZE—SECOND EXERCISE.

width of the shoulders ; then raise the body off the ground by strength of arms. Throw back the shoulders, raise the legs in front, bending them in such a manner that they pass between the arms and the cross-bar of the trapéze, at the same time stretching the arms as much as possible, in order to facilitate the passage of the legs. Then continue to let the legs descend, stretching them as far behind as possible.

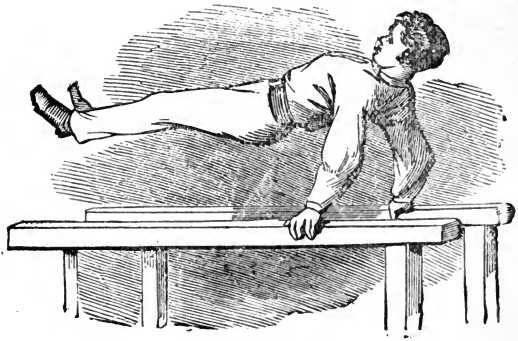
**Parallel Bars.**



Exercise with the Parallel Bars is one of the most common of the numerous feats practised in the gymnasium. They are very easy to perform on, and they are useful as aids to physical education.

In the first exercise, the most simple of all, place the hands on the bars, the thumbs inside, the fingers close together on the outside, and the feet equally close together on the ground ; then make an effort of the arms, bearing strongly on the hands, and raise yourself by a little spring from the ground. Once raised, you can support yourself easily by the arms. Keep your body upright, with your feet down ; then swing forwards and backwards, making a little jump with the hands along the bars.

A second exercise consists of taking the same position, bending the arms, keeping the legs close together, a little bent behind, without the feet touching the ground; now raise yourself by strength of arms, bend down again, and raise yourself once more. Continue the same movements at pleasure. You will soon gain sufficient strength and confidence to enable you to travel from one end of the bar to the other by alternate pressure and movement of the hands; to travel by a series of little jerks or jumps on the hands; and



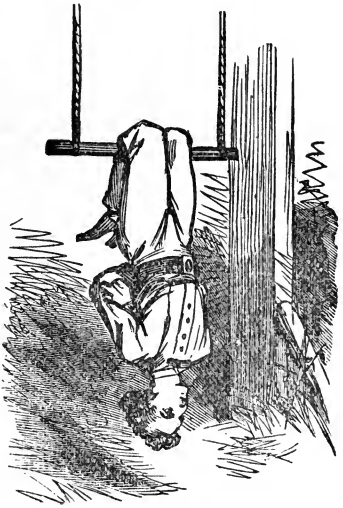
THE BALANCE.

to balance your legs out straight in front, so that the whole of the body be out straight and only resting on the arms.

VAULTING.—This is a rather more difficult operation. To vault from one side of the bar to the other it is necessary to place the two hands on the bars, to swing backwards and forwards once or twice, and then to throw the legs over either side of the bars; if over the right-hand bar, give yourself an extra propulsion with the right hand, so as to avoid the back or any other part of the body coming in contact with the bar. The same principles are observed for the left-hand bar and for the *wooden horse.*

After maintaining yourself in this position for awhile, slacken the hands, and fall softly to the ground, at the same time bringing the hands to the front.

*Third Exercise.*—Raise yourself on the bar as before, taking the position as in the first exercise; then raise yourself to the waist, stretch out the arms to their full length, seize the rope with the right hand, bearing on the right arm, and turn the



TRAPEZE THIRD EXERCISE.

body, in order to seat yourself on the trapéze. Replace the right hand by the left, seize the other rope with the right hand, inclining the upper part of the body a little back; shift the legs back until the cross-bar catches under the back of the knee-joints, the hands at the same time slipping down as far as the cross-bar; then throw the body back, and leave go of the cross-bar with the hands. The body will now

remain suspended by the knee-joints. After hanging in this manner, and swinging backwards and forwards for awhile, you should, while the trapéze is on the swing, leave go with the knees, and jerk yourself in such a manner as to fall to the ground on your feet.

### The Giant Stride.

Most persons who have ever been in an out-door gymnasium are acquainted with the pole and ropes called the Giant Stride. The top of a strong mast is provided with a number of pulleys like a windlass, from which hang a series of ropes, at the end of each of which is an iron or wooden handle. The giant stride is shown so plainly in the frontispiece that any detailed description of it is unnecessary. Two or three performers take each in their right hands one of the handles, and then, at a signal, run to the right or left as far as the rope will allow. The body is held upright, the right leg in advance. The performers, being at equal distances from one another, start off together from the left foot, and begin to throw themselves forward, increasing each time the speed with each round. They should endeavour always to preserve the distances between them by bearing strongly on the right arm and lightly touching the ground with their feet. Now and then the giant stride can be executed in several ways—towards the left by laying hold of the handle with the right hand and the rope with the left; towards the right by holding the handle with the left hand and the rope with the right. The point to be arrived at is to make as many turns as one can without touching the ground with the feet.

## ROWING AS AN EXERCISE.

There is no exercise in the world so exhilarating as Rowing, when properly performed. What sight is more grand, more exciting, more really beautiful than the contest between the

University eights? Newspaper writers are continually telling us, year after year, that the style of each respective crew is "not at all up to the mark," "not at all good;" "the time is bad," "the swing is bad," and so on *ad nauseam;* implying that the general style of University Rowing is deteriorating. And yet these same reporters are gravely unanimous in chronicling the time in which the race is rowed.

In Rowing, as in everything else, there is a right and a wrong way; and yet there is scarcely a river in the world whose champions have not some special marks and characteristics. How different the North-country style and O.U.B.C. (Oxford University Boat Club) boats, or that of American and London Rowing. Yet each one vaunts its own, and the uninitiated continue to be puzzled at the different ways different crews have of Rowing. But even they are beginning to know that sheer physical strength is only a secondary element of success, and something further is required. Propelling a boat must be governed by the ordinary rules of mechanics. A crew can never be as perfect as nicely regulated machines, which have no arms to tire and no breath to exhaust; but it can, nevertheless, approach very closely to the standard, and the best style will be the nearest approach. The inquiry, then, is how to apply the greatest force with the least labour; nor is the problem difficult of solution. All the real hard work of Rowing necessarily lies in pulling the oar through the water: the quicker this is done, the faster speeds the boat, but the greater becomes the exertion. Now, for this dash, weight is required; and where the greatest weight can be thrown on will be the chief point for work, and that point is when the body is farthest in front of its work. In other words, the long forward reach is the only foundation for a strong pull. The stroke which enables men to work naturally with their bodies in the position most adapted for their work, although it does call out the greatest power, is at the same time far less trying than such jerky, spasmodic efforts as strain the body without producing anything like a corresponding effect on the boat. There is one more element: the forward motion must

be slow in comparison with the backward ; without this, the sharp dash is impossible, save for a few strokes, the exertion being too severe. After hard work Nature demands rest; and here the beautiful harmony of good Rowing appears, in that rest and labour merge into one another. The best style, then, for speed and stay, is a long, slow reach forward, and a quick dash backward. A perfect stroke may be analyzed into the following motions :—

1. The body to move slowly forward until at its farthest reach.

2. There the hands to be slightly raised, that the blade may be lowered to the water.

3. A momentary balance, and the body to dash itself backwards from off the stretcher until a little beyond the perpendicular.

4. The oar to be brought well home to the chest by bringing the elbows well past the ribs.

5. The wrists to be dropped sharply, and the hands to spring forward immediately till they are perfectly straight, before the body recommences motion No. 1.

Keep your seat firmly ; bend your body gracefully to the stroke, with your feet firmly planted on the stretcher ; and feather your oar neatly as you bring it out of the water. Avoid jerking the body forward, if you wish to become a good oarsman, and do not dip too deep. Take the side of the stream when rowing against tide, for there you will find the least resistance. In meeting a boat, the one that has the tide in its favour must give way. In turning with sculls, back-water with the left hand, and pull with the right. In landing, bring the boat in slanting to the shore rather than bow in. In cutter-rowing, take time from the stroke-oar, and attend to the coxswain. Avoid crab-catching, by taking a sufficiently deep pull ; at the same time be careful that you do not waste your strength by pulling too deep and throwing up useless water. Keep your back straight, your arms ready, and your legs firm. Lastly, *keep your temper*—a most important caution in all in-door and out-door amusements.

## THE RATIONALE OF SWIMMING.

Much has been written, both wisely and absurdly, about Swimming. As an exercise, however, it should hold a high place in the education of both sexes; for it tends to strengthen the body and renovate the nervous system. The ancients held the art of Swimming in great esteem, and placed it, indeed, on an equality with polite literature; so that when speaking of any one of deficient education, they said, "He has learned neither letters nor Swimming"—*Neque litteras didicit neque natare.*

On the Continent, especially in the military and public schools, Swimming is taught as a regular Gymnastic Exercise. Bérard, the inspector of the French gymnasiums, speaks thus of the methods pursued in the military colleges:—"It will appear surprising, perhaps, that Swimming is included amongst the number of exercises demonstrated in the colleges. One will be the more astonished to learn that the Swimming takes place more in the air than in the water. No part of Gymnastics is more methodically taught in the military schools. Each of the different stages of natation is the object of a special study. You first learn the movements of the arms, then the legs, then the contractions of each of the arms with that of the corresponding leg, until at last, lying flat on your stomach on a stool, you execute with your four limbs at one time the proper movements of the swimmer."

The faculty of sustaining the body in the water is not as natural to man as to the quadrupeds. Man does not swim instinctively, but he can be taught to do so in a few days; and very little practice will give him confidence in the water. The first and most important requisite of the swimmer is confidence. Every lad should know that his body is specifically lighter than the water, and that it is really almost impossible for the body to sink if left to itself. Plain Swimming is a perfectly easy and simple operation. In taking your first dip, do not attempt to jump in, but walk quietly till the water reaches your waist. Now "take a duck," so as

to thoroughly wet your head and the whole of your body. You will soon get accustomed to the sensation, which is exceedingly agreeable in hot weather. Wade a little farther, till the water reaches to your shoulders; then turn your face to the shore, and strike out. Keep your hands open, with the palms rather concave, and the fingers close together, so that no water can pass through them. Now lean with your chest on the water, and as you throw your arms forward your body will assume a horizontal position, just beneath the surface. With slow and steady action let the legs follow the motion of the hands, or rather act simultaneously with them. Then spread the hands so as to describe a half-circle, the elbows coming close to the body, and the hands to the chest. A few yards is all you will accomplish at first. If you feel any inconvenience by the water entering your mouth, close your lips, and it cannot get in. As you progress, the management of the breath will cause you neither trouble nor anxiety. Notwithstanding what you may read in books on this matter, just keep up your head, your body straight, your limbs extended, and your breath will take care of itself. Slow and steady is the rule in learning: swiftness will be certain to come by-and-by.

Keep your head well up, and, in getting ready for each successive stroke, draw back the legs by a simultaneous motion. Keep the feet wide apart, with the toes well turned out; and, as you send out the arms, kick the legs backwards and sideways to their full extent, keeping them separate till they have described as wide a circle as possible, the legs coming close together at the end of each stroke. Press against the water with the sole of the foot, and not with the toes, and then you will get a much better purchase, and make more easy and rapid progress. For you must recollect that, though the limpid water divides easily enough as your hands and feet pass through it, a real resistance is offered by it to the body of the swimmer; and it is on this resistance you must, to a certain extent, rely in propelling yourself forward. Without this simultaneous action of the arms and legs it is

impossible to become a good swimmer. In propelling the body through the water it is of the utmost consequence to use the feet properly; and to do so it is necessary so to turn the ankle-joint that, in drawing the leg up after the kick, the instep, or upper part of the foot, offers the smallest possible resistance to the water. This action of the ankle is exceedingly important, and is, indeed, one of the great secrets of good Swimming.

If the young swimmer is at all nervous, he should get assistance from a friend rather than from corks, ropes, or bladders. A good assistant to the tyro, however, will be found in a heavy plank, on which he may rest his hands occasionally, and so sustain himself, or push it before him as he proceeds. There is no necessity for going out of your depth, for great depth of water is not necessary for ordinary plain Swimming.

Swimming cannot be taught on paper, though you may get from books a few useful instructions. In a sea-girt land like ours it is curious that we should have so few good swimmers. In the busy life of great cities the art of Natation is shamefully neglected; and even in the army and navy Swimming forms no part, or only a very small part, of the young man's professional education. Why, as a people, do we neglect Swimming? Not, certainly, for lack of water, for the country is well supplied with rivers and streams, and the great ocean is everywhere within sixty miles of our homes; not from any natural distaste for water, for our boys love to paddle and bathe whenever and wherever they can; not, certainly, for fear, for, among all the nations of the world, the Anglo-Saxons alone have entirely succeeded in making a friend, a servant, and a plaything of the sea!

## CRICKET AS AN EXERCISE.

Best of all out-door games—the national game of England, indeed—Cricket stands high as a means of exercise. The lad

who plays Cricket regularly throughout the season needs but little training, for its practice is a course of the best training possible. In some form or other, Cricket has existed in this country for nearly four centuries. As a sport it is thoroughly manly, and therefore essentially British. It is impossible to conceive its decay, unless the national character should degenerate, and popular sports cease to be attractive. It is already so venerable as to claim a place among the most cherished and time-worn of our institutions. Although not so old as Magna Charta, it secures quite as much reverence on the part of the majority of those who love the traditions of their fathers. But respect for its antiquity has not prevented its undergoing a steady improvement. Like the British Constitution itself, it has been modified by the laws which experience and the altered circumstances of the times have rendered necessary; and as long as it retains this flexibility, and the grave and youthful seigniors who administer its affairs exhibit the wisdom which is begotten of prudence, so long will it continue to thrive like the great system by whose example it has benefited. The principles of the game have remained the same for a long succession of years, but, after serious and weighty deliberations, new laws have from time to time been promulgated. More than this—like our political fabric, the institution of Cricket has found its way into other lands. It was a long time before it got into France. The gay and versatile Frenchman does not see the fun of hitting, running after, or trying to catch a ball all day long, with the thermometer at 90 degrees; least of all does he care to stand with his hands in his pockets for six or seven hours, while others are broiling under the combined influence of a nearly tropical sun and of self-inflicted and exhaustive labours. He is not versed in the mysteries of bowling, wicket-keeping, long-stopping, and fielding. If he had been "to the manner born"—if he had entered the world with a bat in one hand and a ball in the other—the love of the game, and therefore the power of appreciating it, would have grown up with him; but it is too much to expect that

the athletic youth of Paris will all at once embrace what is to them a new idea, and march off to the Bois de Boulogne to make the sylvan glade ring again with the echo of their virgin bats. Still a Paris Cricket club has been formed, and it is to be hoped that a good result will attend this effort to transplant to another soil what is, after all, an institution of peculiarly English origin and growth.

The Germans are great in all athletic exercises—in running, wrestling, and every gymnastic feat they vie with any nation in the world; but Cricket has never been one of their national games, although the formation of one club in Homburg, and, I believe, of another in Baden-Baden, gives promise that one day the heroes of Lord's and the Oval will be able to pitch their wickets in the very heart of the Teuton nation. This would be a great day in the international history of Cricket. I should like to see an All-England Eleven pitted against an All-Germany Eleven; or as many good bats of our two Universities making up a match with an equal number of such broad-shouldered and strong-armed young students as one may meet with at Bonn and Heidelberg. It would be a friendly contest, which would help to rub off some old prejudices without injury to life or limb. Not less pleasant is it to find that Italy, too, is borrowing our national game. But, after all, Cricket is, and must be for a long time to come, an almost exclusively British sport. Our Cricket-grounds will remain without a rival in foreign lands. The muscular force, combined with so much of true science, which we see exhibited on those broad, springy acres of turf, can only be acquired by the steady training of generations of players from childhood upwards. In England the ranks of the great players are fed from a thousand village clubs. During the summer months the green fields of every hamlet are dotted with cricketers, and once or twice at least in every season rival villages try their mettle in hard-fought conflicts, and endeavour to pluck, the one from the other, the laurels which the victorious alone can wear. Nor are the great towns behind the rural districts. Manchester, Sheffield, Nottingham,

Canterbury, and Brighton make up county and All-England matches, which are every whit as successful as those which attract thousands to the regions of St. John's Wood and Kennington; while Eton, Harrow, Rugby, Cheltenham, Marlborough, and the other great schools, make up capital elevens every year. What wonder then, that, wherever England establishes a colony, Cricket is the pastime of the earliest settlers, and prospers with their prosperity!

## MILITARY GYMNASTICS.

I now give a few brief explanations as to the Gymnastics practised generally in the Army, the rather that my readers may acquaint themselves with the facts than that they may practice the exercises, which are strictly provided for the training of soldiers.

Indispensable requisites for a good soldier are, great activity, precision, and dexterity in all his movements. The ordinary exercises, however, are entirely insufficient to effect this physical training, being directed principally to the carriage of the person, the motions in rank and file, and the management of the weapons. In order, therefore, to render the soldier agile, and to increase his strength and muscle, the practice of Gymnastics, upon which the Greeks and Romans laid great stress, has now been made one of the objects of military instruction, and reduced to a species of system, such as is found most applicable to the wants of war service.

The first exercises of Military Gymnastics relate to the right positions of foot, knee, hip, shoulders, arms, head, and the whole body, to render the limbs pliable and maintain the body in equilibrium; upon which follow the staff and ball exercises, to strengthen the muscles of the breast, arms, and spine. The wheeling exercises, which succeed these, have for object to maintain the good carriage of the body, once acquired, in all directions, and that the wheelings should be made rapidly and with precision; for which purpose the

exercises are continued in advancing, marching, and running, as well in straight line as in zigzag and curve, singly and in rank and file.

The next exercises are in Leaping, partly free, partly with the leaping-pole—the leap in length, the leap in height, and the leap in depth; and then the Swinging or Vaulting. The leaps on to and over the vaulting-horse are divided into longitudinal and cross leaps; the first from behind, the last from one side. At first the effort is only to complete the leap by the assistance of the hand, afterwards without touching with the hands. One of the most remarkable leaps is the Back Leap, where the leaper clears the saddle by a running jump, resting both hands upon the cantles. In rising, the legs are stretched wide, with the toes pointed outwards, so that one leg passes over the crupper, the other over the neck of the horse, without touching him. The hands then let go the cantles, and the deseent is made with the legs close together, the back towards the horse. If it is desired to render the leap more complicated, the half-turn can be made at the same time, bringing the face towards the horse in alighting. Very difficult, also, are the Half and Whole Thief's Leap. The Half-thief's Leap is made by a run directly towards the saddle; then, at the distance of a half to two paces from it, springing up with the left foot alone, bringing the right shoulder, by a turn, directly over the middle of the saddle, the well-extended right leg, with the toes pointed forwards, raised so high as to clear it entirely, and ending in the saddle. The right leg must not be swung over the crupper, but must go directly forwards; the hands are not rested, and must not touch the horse, so that the leap is sometimes made holding at the same time one or two flags or muskets.

In the Full Thief's Leap the spring is made also on the left foot alone, but in rising the right is brought up as well, and the leaper passes entirely over the saddle without touching it, and comes down on the other side of the horse. This leap also is made with flags or muskets, and the half-turn

can be made in it likewise, so that in alighting the face is towards the horse.

After Vaulting come Bathing and Swimming, in which the soldier is practised, not merely in the ordinary swimming and treading water, but also in swimming with the full equipment and carrying the weapons; in exercising and firing while in the water; in riding upon the swimming horse in rank and file; and he is taught also how to proceed in rescuing persons from drowning. (*See* CHAMPION HANDBOOK, "Swimming.")

So soon as these exercises are completed, the men pass to the Beam on the Ground, the Balancing Beam, and the Hanging Beam.

The first exercises only teach the man to preserve his equilibrium, even under the most difficult circumstances, and at the same time not to lose the proper carriage of the body. But when the soldier comes upon the balancing beam he is raised above the ground, and must in the beginning maintain his equilibrium by means of his outstretched arms, until after a time he learns to keep it with his arms folded, is even able to step over objects held in front of him, or to stoop down and remove things which are lying upon the beam; and at the end of the beam to turn round, or to go backwards, and pass another person on the beam. Then follow exercises in balancing on one foot, with the other hanging down, changing the feet, and thus moving forward; and, finally, exercising with the musket upon the beam, which, of course, is placed higher and higher, as the men acquire greater confidence. Lastly comes marching with the whole equipment upon the beam, at first when supported, and finally when suspended from ropes at each end of the hanging beam.

The exercises in Climbing are very various. The men climb first upon a rope-ladder with wooden rungs, then upon the common rope-ladder, carried obliquely to the beam: this climbing is at first with both hands and feet, afterwards with the hands alone. Then come exercises upon the free hanging

rope with wooden rungs inserted, then on a rope which has only knots instead of rungs, and finally on the smooth rope; all of these exercises being also with the hands alone, and on the rope stretched obliquely, in which, at first, to guard against accident, particularly where the climber is using the hands alone, an assistant is employed, who supports the climber by means of a rope passing over a roller. The same exercises are made also between two ropes stretched in the same manner. Then begins climbing on the ladder-pole, an upright pole through which rungs are inserted in the ladder form, or in a spiral line; and this leads to climbing on the smooth pole, of five to seven inches in diameter, which is grasped by the hands, one above the other, and at the same time between the calf of one leg and the shin-bone and ankle-joint of the other (see p. 43). The beam elevated on posts is crossed by the climber, either sitting upon it, as on a horse, or crosswise, and moving forward by the use of one or both hands. In this exercise the climber has two ropes fastened to rings on a girdle round his waist, and passing on each side of the beam to the ground, where they are held by two men, to support him in case he loses his balance. These exercises can also be made hanging, or in other positions. Climbing on a ladder with moveable rungs is a peculiar exercise. The ladder consists of two ladder-rails, which are grooved on the inner side, so that the rungs can be pushed up and down between the two rails. In the middle hangs a rope passing through holes in the rungs, and having a knot for each rung to rest upon. The climber clasps the ladder-rails with his arms, and ascends the rungs with his feet for their assistance. The common ladder is mounted while standing obliquely, at first with both hands, then with the face turned outwards and the hands resting on the ladder behind the back; then only one hand is used, while something is carried in the other; and finally the ladder is ascended and descended without the use of the hands at all. In this assistants are required at first, who keep hold of a rope, which passes over a roller and is fastened to the waist

of the climber, before or behind, to preserve his equilibrium. These exercises can be variously modified; as, for instance, by two persons passing each other on the ladder; by ascending on the front and descending on the back; by overreaching one rung; by ascending and descending on the inside; and at last with the hands alone, the body hanging free in the air; or with hands and feet in the same rung at once.

In all these last exercises an assistant is required at first with a rope, which sustains in part the weight of the body, until the muscles of the arms have attained the necessary strength. To this class belongs also the mounting and descending a ladder, carrying a load on the back, and without the use of the hands, with the aid of an assistant. The last of the climbing exercises is mounting the perpendicular ladder and descending on the other side, after passing round the ladder-rail at the top: this may be done also with the hands alone, after sufficient practice. The next exercise is climbing a wall by means of small orifices made for the purpose. In a wall openings are made, six inches long and four high, and from six to eight inches distant from each other; the climber places his hands and feet in these alternately, and thus mounts or descends the wall. To these exercises belongs also the mounting of a wall by means of a pyramid of twelve persons; the thirteenth is brought in position to surmount the upper angle of a wall from twenty to twenty-two feet high; if the wall is lower, then two, six, or more men are sufficient. It is necessary always to take care that in the lower stages only the strongest men are placed. Narrow ditches are overleaped without assistance, wider ones by means of the leaping-pole; if still wider, and there are strong beams to lay over them, they are crossed as in sieges; if the beams are weaker, with the body in a horizontal position, sitting aside or crosswise; or a rope can be stretched across and fastened to a higher point on the opposite side, upon which men then clamber over. A wall can be scaled by means of the pyramid, of more or fewer men, according to the height; or by the climbing-poles, the knotted rope,

or the rope-ladder. When the top is reached, the descent on the other side is made by leaping down from small elevations, or else knotted ropes or rope-ladders are fastened to props or hooks, and the men climb or are lowered down by these.

Corporeal Exercises.—These are designed to give greater flexibility to the body. They consist, first, of exercises in running and swinging with a rope, which, fastened to an elevated point at one end, is outstretched by the man who holds it at the other, going backwards until he just touches the ground with his toes. In this position the running in a circle and various other running and swinging exercises are performed. Another of these exercises is the swinging over a ditch or river. A frame is erected on one bank, of a height proportionate to the breadth of the stream, and in this a hook is fixed, from which ropes are hung. The man who desires to leap over the stream steps upon a somewhat elevated platform, takes one of the ropes and holds it so that the end hangs loose over his back, while he grasps the rope with both hands outstretched, and leans backwards as far as possible. He then lifts his feet, and thus leaves his standing-place, swinging, pendulum-like, forward to the other side of the obstacle, upon reaching which he lets go of the rope and goes on his way, the rope falling back again to the side whence he came. Exercises of the bars and the horizontal pole form a very important part of these corporeal exercises. The bar on which the first is made consists of two beams fixed upon posts, not very far apart, and in such a manner that they can be raised or lowered according to the height of the exercisers. The exercises are various. The horizontal pole is a peculiar apparatus. Of the numerous exercises upon this, we shall mention only the under-grip, in which the pole is grasped in such a manner that both thumbs are not turned to the same side, but away from each other and outwards; while the hands seize the pole on the outside and from below upwards.

## CONCLUDING REMARKS.

The most convenient times for practising Gymnastic Exercises are the morning and evening. Immediately after meal-times such practice may be injurious to digestion. In the middle of the day the heat is too great in summer to allow of much robust exercise of this kind. An infallible and very simple sign of the exact amount of exercise which we should take is the appetite. If the appetite is good, if the digestion works well, we cannot take too much exercise; but if the appetite falls off, it is necessary to moderate the exercise, for it is a proof that it has changed to fatigue.

Another rule, not less important, is not to employ all our strength at the beginning or at the finish of an exercise. We should proceed gently, increase gradually, and end moderately. This plan of operation is useful in order to avoid the sudden cooling of the body. We need not fear putting ourselves in a perspiration when in the middle of the exercises, but it is necessary to avoid getting in a great heat at the end. In all cases it is advisable to change the clothes after practice. The garments worn during the exercises should be large and loose. Take care not to carry money, knives, &c., in the pockets, as they may be lost or cause accident. A belt is useful to protect the abdomen, strengthen the chest, and save yourself from wrenches arising from any awkward movement. Do not sit on the ground during or after exercise. Whilst hot, neither drink cold water nor wash the face; and when you conclude your exercises clothe yourself well, and do not remain standing about idly.

Our youths have their athletic exercises, such as running, jumping, and cricket—cricket best of all; but adults should by no means neglect Gymnastics. In every village, town, and city I would have a public gymnasium, where all might indulge in the free and uncontrolled exercise of their limbs; and so, in these "degenerate modern times," we might rival the Olympic Games of the ancients.