

The Book of Sports

Containing Out-door Sports, Amusements and Recreations, Including
Gymnastics, Gardening & Carpentering

William Martin

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THE BOOK OF SPORTS:

CONTAINING

**OUT-DOOR SPORTS,
AMUSEMENTS AND RECREATIONS,
INCLUDING
GYMNASTICS, GARDENING & CARPENTERING,
For Boys and Girls.**

**BY
WILLIAM MARTIN,
AUTHOR OF "FIRESIDE PHILOSOPHY," "THE PARLOUR BOOK,"
"INTELLECTUAL CALCULATOR," ETC. ETC. ETC.**

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PREFACE.

The prime object of this book is to induce and to teach boys and girls to spend their hours out of school in such a manner, as to gain innocent enjoyment while they promote their own health and bodily strength. The Author has never lost sight of this object, considering it to be what properly belongs to a Book of Sports.

He has, however, in many instances, had in view, in a subordinate degree, the intellectual improvement of his young readers. He hopes that several of the games, now described in print for the first time, will be found, if not "royal roads," at least delightful ones, to the knowledge of many scientific facts. There seems to be no good reason why the *utile* (considered intellectually as well as bodily) should not find its place in the sports of young people, if it be so skilfully combined with the *dulce* as not to convert pleasure into toil.

To those who assent to what has been stated, the introduction of a chapter on gardening will need no apology.

PART I.

GAMES WITH MARBLES.

One of the best games with marbles is

RING TAW.

Ring Taw

This is played in the following manner:—A circle should be drawn about four feet in diameter, and an inner circle of about six inches being also marked out in its centre, into this each boy puts a marble. "Now then, boys, knuckle down at the offing, which is in any part of the outer circle. Now, whoever shoots a marble out of the ring is entitled to go on again: so mind your shots; a good shot may clear the ring. After the first shot, the players do not shoot from the offing, but from the place where the marble stops after it has been shot from the knuckle. Every marble struck out of the ring belongs to the party who hits it; but if the taw remains in the inner ring, either after it has struck a marble or not, the player is out, and must put in all the marbles he has won. If one player strike another player's taw, the player to whom the taw belongs is out; and he must give up all the marbles he has won to the player whose taw struck his."

LAG OUT OR KNOCK OUT.

This game is played by throwing a marble against the wall, which rebounds to a distance. Others then follow; and the boy whose marble strikes against any of the others is the winner. Some boys play the game in a random manner; but the boy who plays with skill judges nicely of the law of forces, that is, he calculates exactly the force of the rebound, and the direction of it.

The first law of motion is, that everything preserves a state of rest, or of uniform rectilinear (that is, straight, motion), unless affected by some moving force.

Second law.—Every change of motion is always proportioned to the degree of the moving force by which it is produced, and it is made in the line of direction in which that force is impressed.

Third law.—Action and reaction are always equal and contrary, or the mutual action of two bodies upon each other are always equal and directed to contrary parts.

To illustrate the first of these laws,—a marble will never move from the ground of itself, and once put in motion, it will preserve that motion until some other power operates upon it in a contrary direction.

With regard to playing Lag Out so as to win, you must further understand the principle of reflected motion. If you throw your marble in a straight line against the wall, you find that it comes back to you nearly in a straight line again. If you throw it ever so slightly on one side, or obliquely, it will fly off obliquely on the opposite side. If you throw the marble from the point C to the point B, it will fly off in the direction of the point A, and if a marble lay there it would hit it; but if you threw it from the point D, you would stand no chance.

Lag Out

In science, the angle C, B, D, is called the angle of incidence, and D, B, A, is called the angle of reflection.

THREE HOLES.

Three Holes

Three Holes is not a bad game. To play it, you must make three small holes about four feet apart: then the first shot tries to shoot a marble into the first hole. If he gets in, he goes from that to the second, and then to the third hole, after which he returns, and having passed up and down three times, he thus wins the game. If he cannot get in the first hole, the second player tries; and when he stops short at a hole, the third, and so on. After any player has shot his marble into a hole, he may fire at any adversary's marble to drive him away, and, if he hits him, he has a right to shoot again, either for the hole or any other player. The game is won by the player who gets first into the last hole and works his way

back again to the first, when he takes all his adversaries' marbles.

ARCHES.

Arches

To play arches, the players must be provided with a board of the following shape, with arches cut therein; each arch being a little more than the diameter of a marble, and each space between the arches the same.

Arch Board

The boy to whom the bridge belongs receives a marble from each boy who shoots, and gives to each the number of marbles over the arches should they pass through them.

BONCE-EYE.

Bonce-Eye is played by each player putting down a marble within a small ring, and dropping from the eye another marble upon them so as to drive them out, those driven out being the property of the Boncer.

The law of falling bodies may be well illustrated by this game. It is one of the laws of motion, that the velocities of *falling bodies* are in proportion to the space passed over; and the space passed over in each instant increases in *arithmetical progression*, or as the numbers 1, 3, 5, 7, 9.

Bonce-Eye

By the annexed diagram it will be seen, that if a marble fall from the hand at A, when it reaches B it has only the quantity of velocity or force expressed in the angle 1; but when it passes to C, it has the quantity expressed in the three angles 3; when it passes to D, it has the quantity expressed in the angle 5; when it passes to E, it has the quantity expressed by the seven angles marked 7. Thus we may understand why a tall boy has a better chance at Bonce-Eye than a short one.

It is found by experiment, that a body falling from a height moves at the rate of $16\frac{1}{12}$ feet in the first second; and acquires a velocity of twice that, or $32\frac{1}{6}$ feet, in a second. At the end of the next second, it will have fallen $64\frac{1}{3}$ feet; the space being as the square of the time. The square of 2 is 4; and 4 times $16\frac{1}{12}$ is $64\frac{1}{3}$; by the same rule, it will be found, that in the third second it will fall $144\frac{3}{4}$ feet; in the fourth second, $256\frac{2}{3}$; and so on. This is to be understood, however, as referring to bodies falling where there is no air. The air has a considerable effect in diminishing their velocity of descent.

SUN AND THE PLANET TAW.

Sun and Taw

This is an entirely new game, and consists of the Sun in the centre, which may be represented by a bullet, because the sun is the most ponderous body of the system, and will in this game be required to move slowly. The planets moving round him, with their satellites, I represent by marbles. Now, each boy must take the place of a planet; and having taken it, he is required to put down as many marbles as there are satellites belonging to it. The boy who plays Mercury, puts down only one for his planet; the boy who plays Venus does the same; he who plays the Earth, has to put down one for the Earth, and one for the Moon, its satellite; the boy who plays Mars puts down Mars and the four satellites that lie between the orbits of Mars and Jupiter; the boy who plays Saturn puts down one for the planet, and draws a ring round it, outside of which he puts the seven satellites in any position he chooses; the boy who plays the planet Herschel, puts down one for the planet, and six for the satellites. Each boy, having taken his place in this manner, lays down his taw on any part of the orbit of his planet he pleases, being the point from which he must make his first shot.

The rules of the game are very easy; but it is necessary to be perfectly acquainted with them, as it saves much trouble, and prevents disputes; and no one ought to play till he understands them tolerably well.

1. The players must each put his marble into a hat, and turn down the hat over the sun; then, as the marbles fall near or far from the sun, the planets are taken.
2. The player who puts in Mercury has the first shot.

3. No planet can be taken till the Sun has been struck beyond the orbit of Mercury.
4. The player who strikes the Sun beyond the orbit of Mercury, receives from the person who holds the orbit, as many marbles as there are planets or satellites in the orbit in which it stops.
5. The orbits are,—for Mercury, all the space between the Sun and him; for Venus, the space between Venus and Mercury; for the Earth, the space between the Earth and Venus; for Mars, the space between Mars and the Earth; for Jupiter, the space between Jupiter and Mars; for Saturn, the space between Saturn and Jupiter; for Herschel, the space between Herschel and Saturn.
6. If a player succeeds in knocking the Sun on the line of his own orbit, he receives one from every shooter so long as it remains there.
7. If the Sun is knocked against a planet, the player doing so has to pay two to the owner of the planet.
8. If the Sun be struck within the orbit of a planet, the player striking it receives one if for Herschel, two for Saturn, three for Jupiter, four for Mars, five for the earth, six for Venus, and seven for Mercury.
9. The player who succeeds in knocking the Sun beyond the orbit of Herschel, wins the game; that is, he receives one from each player, and all the marbles on the stake in the inner circle.

MOTIONS OF THE PLANETS AND THEIR SATELLITES.

10. When a planet is knocked out of the outer ring (the orbit of Herschel), it belongs to him who strikes it out: the loser must replace it by putting a marble down in its *original* place.
11. When a planet is struck within the orbit of any other planet, the player striking it there has to pay him to whom the orbit belongs, as many marbles as there are satellites.
12. Should a player's taw, after it has struck another taw, a planet, or a satellite, fall into its own orbit, he has to put one in the inner ring as stakes for the winner

of the game.

13. If a player gets his taw within the inner ring, it must remain there for the winner, and he cannot play any more.

14. If a player has all his satellites taken, he then becomes a Comet, and can shoot from any part of any of the orbits every time the Sun is struck.

15. No player can shoot at his own planet or satellite.

16. Any player who strikes a planet or satellite within Saturn's ring, forfeits three to the inner circle. If he strikes the Sun, then he may take up Saturn and all his satellites remaining within his orbit.

17. After the first shot, every player must shoot from the place at which his taw rests.

Such are the laws of Sun and Planet Taw, and it will be found that in playing the game, some degree of thought is requisite, and a little calculation respecting the moves. It may be judicious for a good shooter to keep the Sun within the orbits as long as possible; or till such time as the inner ring gets *fat* with the forfeitures, or he may drive him from orbit to orbit where the forfeitures are large. He will endeavour to place him on the line of his own orbit. He may also strive to place his adversaries' taws within the inner ring, and to be careful in striking planets that they fall into the orbits where the forfeitures are small. By thus thinking of what he is about and exercising forethought and prudence, he will soon become expert, and by paying attention to the game he will make it his own.

PYRAMID.

To play Pyramid, a small circle of about two feet in diameter should be made on the ground, in the centre of which is a pyramid formed by several marbles,—nine being placed as the base, then a layer of four, and one on the top; and the Pyramid keeper asks his playmates to shoot. Each player gives the keeper one for leave to shoot at the Pyramid, and all that he can strike out of the circle

belong to him.

Tailpiece

PART II.

GAMES FOR COLD WEATHER.

Prisoner's Base

One of the best of these is called

"PRISONERS' BASE."

To play this, there must be a number of boys, not less than eight or ten, and as many more as can be got together. To commence it, two semicircles are drawn against a wall or hedge at the opposite sides of the playground. These are called the BOUNDS.

Two other spaces are then marked out a little away from these to the right or to the left. These places are called the PRISONS.

The game is commenced by a player from one side running out midway between the bounds or prisons, a player from the other side immediately following to capture him; one from the other side follows after the second to capture him, and so on, both parties sending out as many as they think fit. The object of each player is to intercept and touch any player of the opposite side *who has left his bounds before him*, but he is not at liberty to touch any that have started after him; it being their privilege, if they can, to touch *him* before he gets back to his own bounds. A player must touch only one person each time he leaves bounds, and cannot be touched by another after he has taken a prisoner. Every player who is touched, must go to the prison belonging to his adversaries, where he must remain until one of his own side can touch him; and prisoners can neither touch nor be touched in their return to their own bounds again. The game is won by that side which has taken all the other party prisoners.

STAG OUT.

In this game, one boy personates the Stag, and with his hands closed together, starts from his bounds after the other players. When he succeeds in touching one who is called the Ass, the first who gets to him rides him back to the bounds. The two then go out in the same manner, then three, and so on, till the whole are caught.

WARNING.

This game is something similar to another very good game called "WARNING," which may be played by any number of players. One begins the game in the same manner as in "Stag Out," repeating the following words,—"Warning once, warning twice, warning thrice—A bushel of wheat, and a bushel of rye, when the cock crows, out jump I—Cock a doodle doo." He then runs out and touches the first he can overtake, who returns to bounds with him. The two then join hands and sally forth, and touch a third, who joins hands with the other two: again they sally hand-in-hand, the two outside ones touching as many as they can. Immediately a player is touched, they must break hands and run back to the bounds. If any of the out-players can catch any of those who held hands, they may ride them back to their bounds. When three are touched, he who first begins the game has the privilege of joining the out-players, whose object is always to break the line.

MOUSE IN THE CORNER.

In this game, one of the players takes the part of Puss, and places himself in the centre, and the others playing take up their positions in the four corners of the playground. Each of the players calls out, "Puss, puss, puss, pretty puss,—how do you do pussy," and endeavour to pass from corner to corner. The players are at liberty to change corners in all directions, and if Puss can touch one when he is away from his corner, the one so touched, after giving Puss a ride round the ground, becomes Puss, or if Puss can take a vacant corner, the player without a corner must do the same,—give Puss a ride round and become Puss.

KING OF THE CASTLE.

This is not a bad game. One player, called King of the Castle, places himself on a little rising mound; the other players endeavour to push or pull him from his elevation, and whoever succeeds in this, takes his place.

HIPPAS.

Hippas

This game is something like the preceding, only that one boy mounts on the back of another, who is called his Horse, another boy does the same, and the two mounted boys endeavour to pull each other from the saddle. This play is harmless when a soft piece of turf is chosen, but dangerous on the stones or hard ground.

THREAD THE NEEDLE.

This is a good game,—any number of boys may play it. It is begun by joining hands; and the two outside players at each end commence the game by the following dialogue:—

How many miles to Babylon?

Three score and ten.

Can I get there by candle-light?

Yes, and back again.

Then open the gates without more ado,
And let the king and his men go through.

The player who stands at the opposite end of the line, now elevates his hand, joined in that of the player next him, to form the needle's eye, and the other outside player approaches running, and the whole line follow him through, if possible, without breaking. This is continued, each end holding up their hands successively, till the players are tired of the sport.

TOUCH.

This is a game of speed. One volunteers to be Touch, and he pursues the other players till he comes up with one of them and touches him; unless the player so touched can say, "I touch iron," or, "I touch wood," before he is touched, he becomes Touch, and must give the player who touched him a ride home. A player is liable to be touched only when running from one piece of wood or iron to another.

There is another and a better game of Touch, called "Cross Touch," which is played thus:—One volunteers to be Touch, and sallies forth from his bounds. While he is pursuing one of the players, a third player runs between him and the player pursued, and touch must then follow the one who crosses till another crosses them, and so on, till at length the whole playground will become a scene of activity and sport.

BOWLS.

"I will play at *Bowls* with the sun and moon."—*Byron*.

"He who plays *Bowls* must expect rubbers."—*Bowles*.

This is one of the best of games for hot or cold weather, for it is excellent exercise, and requires skill and judgment. Few requisites are required for it, but a level lawn, or tolerably level field, is indispensable, as are the bowls, the Jack, and the players.

In playing bowls, partners may be chosen, if there are many players, or the game may be played by two persons. When, however, there are three or four of a side, there is more interest attached to the game. The best player of my time was the good old schoolmaster, Mr. Fenn, from whom I obtained all the particulars concerning Bowls.

The bowls used at this game are of wood, loaded with lead, or *biassed*, as it is called, namely, there is one side thicker than the other, which is marked, and this may be held either near or away from the thumb as it may be required to lay the ball. No writer in a book can teach this, as it depends upon the nature of the

ground, and the situation of the balls already bowled.

Before commencing the game, the first player leads out a small white ball, called a Jack; he then lays his own balls as near to it as possible; the players then follow in succession, but no partners follow each other till the whole balls are delivered, and those who obtain the nearest points to the Jack score one for each ball.

The number making the game is arbitrary, but eleven is generally fixed upon. Of course it would be more were there a great number of bowlers. The sport of the game consists in driving your opponent's ball from the Jack, and putting your own near it. When one side scores eleven before their opponents get five, it is called a *lurch*. The players at Bowls change the Jack from one side of the green to the other after the whole of each side have bowled once.

QUOITS.

"*Quoit me down, Bardolph.*"—*Shakspeare*.

The game of Quoits resembles Bowls. It is played with flat rings of iron of various weights. At a certain number of paces apart (to be agreed upon), two circular pins of iron are driven into the ground. The players beginning the game stand at one of these pins, called the Hob, and pitch the quoits to the other, each person having two. When all the quoits are cast from one Hob, the players walk to the other and pitch to the first, and so on in succession.

Those who get nearest to the Hob, are, of course, nearest to the game, and each pair of quoits counts two,—each single quoit, one; but if a quoit belonging to A lies nearest to the Hob, and a quoit belonging to B the second, A can claim but one towards the game, although all his other quoits may be nearer to the Hob than all those of B, as the quoit of B is said, technically, to have *cut them out*.

WHY AND BECAUSE.

Why and Because

This is also a new game, and one of those that combine amusement and instruction. To play it, a king must be chosen, who is called "King of the Shy," who sets up a brick on its end and puts a stone upon it, as a mark for the players to bowl their stones at, which they do successively. When a player has bowled, if he knocks the stone off the brick, he may take up his own stone and run back to his bounds, if he can do so before the king sets his brick and stone up again; but if the King can touch the player after having set his brick up, he is obliged to answer a "Why," or be King instead of him. The "Why" must be proposed by the King, and it may either be a conundrum, or it may contain the reason of any thing, as, "Why does a stone fall to the ground?" "What makes the smoke go up the chimney?" If the player cannot answer the "Why," he is obliged to mind the shy and let the others bowl. Sometimes it will happen, that of all the boys who have bowled at the shy, not one has thrown it down; the King then looks sharply at each one who tries to take up his stone, to touch him. It generally happens, that whilst the King is pursuing one, who has taken up his stone, to touch him, all the rest take to their stones, and make off home. But it should have been said, that by the place from which they bowl, a string is stretched for a leap, over which a player running from the King is obliged to jump before he is considered home.

(Some good Conundrum Questions for this game will be found in the "BOOK OF SPORTS," on In-Door Amusements.)

BOMBARDMENT OF A SNOW CASTLE.

There is no game like this for promoting warmth and exercising the ingenuity. To play this, a Snow Castle, Tower, and Fort must be constructed, and a Bombardment got up.

When the snow is on the ground, let a party go into a meadow and divide themselves into two companies, and appoint a general to each. Each company then takes up its respective position, and proceeds to build a fort and castle, for defence, on each side; the dexterity with which the work is performed, and the celerity with which it is accomplished, being much in favour of those who play. During the building of the castle, some must be employed as sharp-shooters, who must annoy the builders on each side with snow balls, and some must be employed in making a store of snow balls for the magazine. When the castle is

commenced, the first thing to be done is, for several of the builders to make a roll of snow about eighteen inches in length, and as thick as his arm, and to roll this on the snow, which will attach itself to it till it forms a large ball as high as the builders's shoulders. This must be turned over on its flat side, and as many more as can be arranged in the following manner, for a fort (supposing the other side to be erecting a castle). The foundation thus being laid, other balls not quite so large must be rolled up and laid on the former, so as to make the rampart about four feet high. Behind this, a single line of snow balls must be placed, about one foot in height, on which the attacking party may mount to discharge their balls to the castle opposite. On elevated parts of the forts, long sticks with pocket-handkerchiefs, as flags, must be raised, and in the centre, a larger flag should be placed, and it must be the object of the opposite party to demolish them with their balls. When a player wishes to throw a ball, he mounts upon one of the inner partings of snow, discharges his shot, and jumps down behind the parapet for more shot. The party on the opposite side may build their castle as they please; but each party should watch each other's movements, and build their different places of defence or annoyance in such a manner as to defend themselves and annoy the enemy in the most effective manner. It may be observed, that the fort must be so constructed with reference to the castle, that it is brought to bear on every point of it. The two ends are towers, which should be a foot higher than the ramparts, and should be made by three snow balls laid one upon the other,—the last one being turreted, with room for one boy to mount to the top, if necessary, to discharge his shots. The highest place of all, is the keep, and should be at least six feet high, with room and steps behind for two boys to mount. Convenient places should be left behind, where the ammunition should be piled up.

When the fort or castle is built, each party uses its best efforts for the demolition of the other, but no one is allowed to make use of his hands in the demolition of either castle or fort; battering-rams may alone be employed. In ancient times, battering-rams were large beams, hooped and shod with iron; but the moderns do things better, and the way in which it may be done is as follows:—A boy who volunteers to be battering-ram has his legs tied and then two other boys take him up, and, swinging him by the arms and legs, force his feet against the walls of the castle or fort to batter it down, the opposite party pouring on them, all the while, snow balls heated to a white heat from the ramparts above. Parties also may go out from one side to the other, as in playing "Hippas," mounted, and may meet in the open space and endeavour to pull each other from their horses. If a player on either side can break over the fort and capture one of the flags without

being touched, he may bring it off and place it on his own ramparts as a trophy, and the party from whom the flag is captured must not replace it; but if in this act he is touched, he becomes a prisoner, and must make snow-balls for his adversaries. Every one who is thrown down, either from his horse or by any other means, is considered a dead man, and can do nothing but make snow-balls for the opposite party. When the flags are all struck on either side by being shot away, or when the men are all taken prisoners or slain, or when the ramparts are demolished, the victors may sing, "Old Rose and burn the Bellows."

BANDY BALL OR GOLF.

This game is played with a bat and a small ball; and the game consists in driving the ball into certain holes made in the ground. Sometimes these holes from first to last, are at the distance of half a mile or even more from each other. There are many intervening holes. Those who drive the ball into the greatest number of holes, of course win the game; but the ball must never be driven beyond a hole without first going into it. If the ball passes in the way beyond a hole, the player is out.

FOOT BALL.

Foot Ball is a very simple game. A large soft ball is procured (which is now made of Gutta Percha), and the players having assembled and taken sides, a line is drawn across the playground, and the play commences. The object of the play is, for each party to kick the ball across the goal of the other, and to prevent it from passing their own. The party into whose bounds the ball is kicked, loses the game.

TRUSSING.

This is an excellent game. In some places it is called "Cock Fighting." To play it, two players must be matched against each other, and one is sometimes called

"Black Cock," and the other "White Cock." They are seated on a carpet, or, what is better, the floor of the play-room, and undergo the operation of "trussing." This is performed as follows:—The hands are first tied with a handkerchief at the wrists. The ancles are tied in the same manner. The Cock then has his hands brought to his instep, while his knees pass between his arms, and a short stick is thrust in under the knees and over the joints of the elbow, and secured in this situation. The fight now begins by each Cock advancing towards his enemy, and when they come close to each other, each endeavours, by inserting his toes under the other's feet, to capsize him and throw him over on the side; and whoever does this, is entitled to *crow*, and is winner of the game. There is often a good deal of fun in this game, and the players can rarely hurt each other.

FOLLOW MY LEADER.

Follow My Leader

Follow my Leader is a very good game; and when the Leader is a droll boy, causes much fun and laughter. The leader starts off at a moderate pace, and all the other boys, in a line, one after the other, follow him. They are not only bound to follow him, but do exactly what he does. If he hops on one leg, or crawls on the ground, or coughs, or sneezes, or jumps, or rolls, or laughs, all must do the same. If any boy fail to follow his Leader, he is called the "Ass," and must be ridden by the boy next him. Sometimes the Leader will leap a ditch, climb a tree, or run into a river. But boys should be careful of very mad pranks in this sport.

BLINDMAN'S BUFF.

In this game, a person is blindfolded, and endeavours to catch any one of the players, who, if caught, is blindfolded and takes his place.

There is another Game something resembling it, called SHADOW BUFF. A piece of white linen is thrown over a line across the room; between this screen and close to the wall on one side, a candle is placed, and on the other side, Buffy is obliged to stand, while the players moving between the candle and linen show their shadows through it, and Buffy has to distinguish each person by his shadow. When he does this, the player so found out becomes Buffy and takes his place.

TIP-CAT.

For this game a piece of wood must be procured about six inches in length and two inches thick, of the following shape:—

Tip-Cat

that is, of a double curve. It will be seen by the shape of this, that it will fly up as easily as a ball when it is laid in the trap, for the striker has only to tap one end of it, and up it flies, making many a summerset as it rises; while it is performing this turn-over motion, which philosophers call the rotatory, the striker makes a blow at it and sends it whither he pleases.

The proper way to play the game, is as follows:—A large ring is made on the ground, in the middle of which the striker takes his station; he then tips the Cat and endeavours to strike it out of the ring; if he fail in this, he is out, and another player takes his place. If he strike the Cat out of the ring, he judges with his eye the distance the Cat is driven from the centre of the ring, and calls for a number, at pleasure, to be scored towards the game. The place is now measured by the stick with which the Cat is struck, and if the number called be found to exceed the same number of lengths of the cudgel, he is out, but if it does not, he obtains his call. Another method of playing, is to make four, six, or eight holes in the ground in a circular direction, at equal distances from each other, and at every hole is placed a player with his cudgel. One of the party who stands in the field, tosses the Cat to the batsman who is nearest to him, and every time the Cat is struck, the players must change their situations and run over from one hole to another in succession. If the Cat be driven to any great distance, they continue to run in the same order, and claim a score towards their game every time they quit one hole and run to another. But if the Cat be stopped by their opponents, and thrown across between any two of the holes before the player who has quitted one of them can reach the other, he is out.

JINGLING.

This game is common to the West of England, and is called a "Jingling Match." It is played by a number of players being blindfolded within a ring formed for the game, and one or two others, termed the "Jinglers," not blindfolded, with a bell fastened to their elbow, also enter the ring. The blinded players have to catch the Jingler, who moves about rapidly from place to place. He who catches the Jingler wins the game; but if after a certain time, agreed upon previously by the players, the Jingler is not caught, he is declared the victor.

FRENCH AND ENGLISH.

French and English is another good game. A rope being provided, two players stand out, and after having cleeped for first choice, select the partners. After an equal number has been selected for each side, one party attaches itself to one end

of the rope, and the other party lays hold of the other: a line is then made on the ground, and each party endeavours to pull the other over this line. The party succeeding in this, wins the game.

Tailpiece



PART III.

DANGEROUS GAMES.

And now that we have given a description of some good games, it may be as well to warn our readers of some bad or foolish ones, which are either calculated to spoil their clothes, make them very dirty, or are dangerous to their limbs.

HEAP THE BUSHEL.

This is a very dangerous game, if it can be called a game. Should one boy happen to fall, it is the practice of other boys to fall upon him and to "Heap the Bushel," as it is called, all the other boys leaping on the one already down. It sometimes happens, that those underneath are seriously injured; and the sport is seldom engaged in without quarrelling among the players, and sometimes it leads to a fight.

DRAWING THE OVEN.

This is another dangerous game. It consists of several players being seated on the ground in a line, clasped by each other round the waist: when all are thus united, two others take the foremost one, and endeavour by pulling and tugging to *break him off* from the rest. Thus the united strength of several boys before, and as many behind, is made to act upon the one in front, and an arm may be dislocated by a sudden jerk, not to say anything about a broken neck.

HOP-SCOTCH.

This is a silly game. It is calculated to wear out the shoes.

BASTING THE BEAR.

This is another silly game. A boy, who is called the "Bear," kneels down on the ground in a ring marked out, to let the other boys beat him with their twisted or knotted handkerchiefs. The master of the Bear, who holds him by the rope, endeavours to touch one of the assailants; if he succeeds in doing this, without pulling the Bear out of his circle, or letting go the rope, the player touched becomes Bear in his turn. But it is calculated to spoil the clothes of the Bear, and sometimes, should he kneel on a sharp stone, may do him much injury.

BUCK, BUCK.

"Buck, Buck, how many horns do I hold up?" is also a stupid game. It neither requires speed, nor agility, nor wit. The game is played by one boy resting his head against a wall and making a back, upon which the other jumps, who, when seated, holds up as many of his fingers as he pleases, and cries, "Buck, Buck, how many horns do I hold up?" The player who is leaped upon, now *makes a guess*; if he guesses correctly, it is his turn to leap, if not, the leaper leaps again. But there is little good in all this, and it ought not to be encouraged.

PART IV.

GYMNASTICS.

All boys, and girls too, ought to train themselves to habits of agility, and nothing is more calculated to do this than Gymnastics, which may be rendered a source of health and amusement.

In all playgrounds, a piece of ground should be laid out; and there should be erected thereon, a couple of posts, about twenty feet apart, and sixteen feet high, which should support a plank, about a foot wide, and six inches thick; on the underside of this might be affixed a hook, from which a triangle might be swung, —this is capable of being used in a variety of ways. Two more hooks, about a foot apart, might be used for two ropes, so that the more advanced pupils could climb to the top by means of grasping a rope in each hand, and without the assistance of the feet. A pole may rise from the ground to the cross piece about midway: the pupils will be able to climb up this without the assistance of the feet. A wood ladder and rope ladder may occasionally be fastened to the beam, but may, when necessary, be taken down. A board about a foot broad may also be set up against the beam, inclining four feet from the perpendicular: the climber will grasp the sides with his hands, and placing his feet almost flat against the board, will proceed to the top: this is an advanced exercise. Another board may be set up which should be three feet broad, at least, and should slant more than the other: the pupil will run up this to the top of the beam easily, and down again. The middle of this, up to the top, should be perforated with holes about four inches apart, in which a peg may be placed: this may be in the first hole to begin with. The pupil will run up and bring this down, and then run up and put it in the second, and so on, till he has arrived at the top: then two or more pegs may be used, and it may be varied in many ways. A pole, twenty-five or thirty feet high should be erected, rather thin towards the top: at distant intervals of this, three or four pegs, as resting places, should be fastened; another pole, thicker, from about sixteen to twenty feet high, should be erected; on the top of which should be placed four projecting hooks turning on a pivot: to these hooks four ropes should be attached, reaching to within two feet from the ground. This is called the "Flying Course," from an individual taking hold of the peg at the end of each rope.

One person may cross a rope under the one in possession of another, and by

pulling round hard, make the other fly over his head. Care should be taken to make the hooks at the top quite secure, for otherwise many dangerous accidents might ensue. A cross pole might also be set up, but most of the exercises for which this is used, may be performed by the triangle. On the parallel bars, several beneficial exercises may be done, and also on the bridge. This is a pole thick at one end, thin at the other, and supported at three or four feet from the ground by a post at one end and another in the middle, so that the thin end vibrates with the least touch. This, it will be evident, is an exercise for the organ of equilibrium, and exercises the muscles of the calf, of the neck, and anterior part of the neck, and those of the back, very gently. On this bridge a sort of combat may be instituted,—two persons meeting each other, giving and parrying strokes with the open hands. The string for leaping is also another very pleasing exercise. It is supported by a couple of pegs on two posts fastened in the ground. The string may be heightened and lowered at pleasure,—it may be raised as high as the leaper's head when a leaping-pole is used. Besides these arrangements, a trench about a foot and a half deep should be dug, and widening gradually from one foot to seven, for the purpose of exercising the long leap either with or without the aid of the pole. Such are the general arrangements of a gymnasium, but before the youth enters upon regular exercises, he may commence with a few preliminary ones.

FIRST COURSE.

Step 6 **STEP 6.**

Step 12 **STEP 12.**

EXERCISE 1. The pupil should hold out his hand at arm's length, until he can hold it out no longer, and repeat it until he has power in the muscles, to continue it, without fatigue, for a considerable length of time.

2. Stand on one foot till he is tired, and repeat this for a similar period.

3. Hold out both arms parallel with his chin, letting the thumbs and fingers touch each other.

4. Hold the hands behind the back in a similar manner, the arms being stretched as far backward as possible, and hold the hands high.

5. Hold up the right foot by the right hand, extending the leg and arm by degrees.
6. Hold up the left foot in the same manner.
7. Stand with the knees bent, and exercise them towards the ground, until he can kneel on both knees at once without supporting himself as he drops.
8. Raise himself from this position without the aid of his hands, by springing back on his toes.
9. Endeavour to touch both his toes, with the back straight, the legs close together, and the head down.
10. Take a piece of wood, three inches broad, and twenty long, that will not bend, and hold it across the back, the three first fingers touching the wood.
11. Endeavour to sit, but not touch the ground, nor let any part of his body touch his heels, with his arms stretched out in a line with his chin.
12. Stand with his arms and legs extended, so as to form the letter X.

SECOND COURSE.

Let the pupil:—

Step 15 **STEP 15.**

Step 17 **STEP 17.**

Step 19 **STEP 19.**

13. Lie down on his back, and raise his body from an horizontal to a vertical position, without any assistance from the hands or elbows.
14. Draw up the legs close to the posterior part of the thighs, and rise without other assistance.
15. Extend himself on his back again, and walk backwards with the palms of his hands and his feet.

16. Sustain the weight of the whole body upon the palms and the toes, the face being towards the ground.
17. Lie on his back, and take hold of each foot in his hands, and throw himself on his face by rolling over.
18. Lie with the face down, and take hold of his toes while in that position.
19. With his chest downwards, drag his body along by walking only with his hands.
20. Place himself on his back, and endeavour to advance by means of the propulsion of the feet.
21. Place his body on his hands and feet, with the breast upwards, and endeavour to bring the lips to the ground.
22. Lean on the breast and palms of the hands, and throw the legs over towards the back of the head.
23. Stretch himself on the back, and extending the hands beyond the head, at the utmost stretch, touch the ground, and, if possible, bring up a piece of money, previously to be placed there.
24. In the same manner, endeavour to seize a ball by the toes at full length.

WALKING.

These preliminary exercises having been practised, the young pupil will commence a course of more advanced exercises, such as walking, running, leaping, balancing, vaulting, and climbing. Walking is common to all, but few persons have a good walk, and nothing exhibits the person to so much disadvantage as a slovenly bad gait. It is true, that the walk of a person will indicate much of his character. Nervous people walk hurriedly, sometimes quick, sometimes slow, with a tripping and sometimes a running step; phlegmatic people have a heavy, solid, and loitering step; the sanguine man walks rapidly, treads somewhat briskly and firmly; while the melancholic wanders, and seems almost unconscious of touching the ground which he seems to slide over. But the

qualities of the mind itself manifest themselves in the gait. The man of high moral principle and virtuous integrity, walks with a very different step to the low sensualist, or the cunning and unprincipled knave; therefore the young pupil will be sure that even the art of walking, which seems to be an exertion purely physical, will not be acquired properly if his mind has taken a vicious and unprincipled bias: it will either indicate his pride or his dastardly humility, his haughty self-sufficiency, or his mean truckling to the opinion of others, his honest independence, or his cringing servility. But he who has been blessed with the full use of his muscular powers, in proportion as he is virtuous, will, with a very little attention, indicate by his bearing, step, and carriage, the nobility of his mind.

In walking, the arms should move freely by the side—they act like the fly-wheel of an engine, to equalise the motion of the body, and to balance it. One hand in the breeches pocket, or both, indicates the sot, and has a very bad appearance. The head should be upright, without, however, any particular call being made upon the muscles of the neck to support it in that position, so that it may move freely in all directions. The body should be upright, and the shoulders thrown moderately backwards, displaying a graceful fall. When the foot reaches the ground, it should support the body, not on the toe or heel, but on the ball of the foot. This manner of walking should be practised daily, sometimes in a slow, sometimes in a moderate walk, and sometimes in a quick pace, until each is performed with elegance and ease.

RUNNING.

In running, as the swiftness of the motion steadies the body in its course, without the aid of the oscillations of the arms, they are naturally drawn up towards the sides, and, bent at the elbows, form a right angle. Their motion is almost suspended in very swift running. In moderate running, a gentle oscillation is observed, increasing in proportion as the body approaches to the walking pace. The knees are now more bent,—the same part of the foot does not touch the ground, the body being carried forward more by the toes. The degree of velocity is acquired in proportion to the length and quickness of the steps. The person should therefore endeavour to ascertain whether long or short steps suit his muscular powers best; generally speaking a moderately short step, quickly repeated, accelerates motion most. In learning to run, the pupil should first

endeavour to improve his breath by degrees: he must try his speed first in short distances, to be gradually increased: the distance will vary according to the age and strength of the runner. The first exercises in running should commence at a gentle trot over a distance of a hundred and fifty yards, at the rate of about six feet to a second: this should be varied up to eight feet in a second, for the first three or four days, and the distance increased from one hundred and fifty to two hundred and fifty yards. On following days, the distance may be increased to five hundred yards, and afterwards gradually, until a mile can be performed in ten minutes, which is tolerably good running. Afterwards, six miles may be tried in an hour, which will be easily accomplished.

As regards rapid running, from one hundred feet to one hundred yards may be attempted at full speed, and when the constitution is good, the body not too fat, the muscular developments fine, and the lungs sound, a quarter of a mile a minute may be accomplished, and a mile in five minutes, which is seldom done even in very good running. Ten miles an hour, which is the average speed of the mail, may, however, be easily performed with judicious and proper training.

LEAPING.

In leaping, that with the run, is the most common and the most useful. The object of the run is to impart to the nerves of the body a certain quantity of motion which may carry it onwards after the propelling power has ceased to act when the body leaves the ground. The run need not exceed twelve or fifteen paces: in this the steps are small and rapid. When the body leaves the ground, the legs are drawn up, one foot generally a little more than the other; and a great thing to be avoided, is coming to the ground on the heels. When springing, the height of the leap must be calculated, the breath held, the body pressed forward, and the fall should be upon the toes and the ball of the foot, although in an extended leap this is impossible. Leaping must, like running, be practised gradually; in the high leap, a person may easily accomplish the height of his own body, and should practise with the bar, which may be made of two upright posts bored, through which ropes should be placed according to the height required for the leap: on these should be hung a string with weights attached to each end to keep it straight. Should the leaper touch it with his feet as he takes his leap, it will be thrown off the pegs, thus showing that he did not make a clean leap.

The deep leap may be acquired from the top of a bank into a hollow, and is useful in leaping from the top of a house or wall in a moment of danger. It may be practised from a flight of steps, ascending a step at a time to increase the height, till the limbs can bear the shocks, to break which, the body must be kept in a bent position, so that its gravity has to pass through many angles. The leaper should always take advantage of any rivulet that has one bank higher than the other, to practise himself.

In the long leap, a person ought to be able to clear with a run, three times the length of his body.

Leaping

The high leap, the deep leap, and the long leap, may be all practised with the pole. For the high leap, the pole should be taken with the right hand, about the height of the head, and with the left hand, about the height of the hips; when put to the ground, the leaper should spring with the right foot, and pass by the left of the pole, and swing round as he alights, so as to face the place he leaped from. In the deep leap, the pole being placed the depth you have to leap, the body should be lowered forward, and then, the feet being cast off, swing round the pole in the descent. The long leap, with the pole, is performed much in the same manner.

Leaping

CLIMBING.

Climbing

In climbing the rope, the hands are to be moved one above the other alternately; the feet should be crossed, and the rope held firmly by their pressure: sometimes the rope may be made to pass along the right thigh just above the knee, and wind round the thigh under the knee.

In climbing the upright pole, the feet, legs, knees, and hands touch the pole. Taking a high grasp of the pole, the climber raises himself by bending his body, drawing up and holding fast by the legs, and so on alternately.

THE ROPE LADDER.

The climber must keep the body stretched out, and upright, so as to prevent the steps, which are loose, from being bent forward.

The oblique rope must be climbed with the back turned towards the ground, the legs crossed and thrown over, so that the rope passes under the calf, and thus he must work himself up by raising his hands one above the other alternately.

The exercises on the ladder are:—1. To ascend and descend rapidly. 2. To ascend and descend with one hand. 3. Without using the hand. 4. Passing another person on the ladder, or swinging to the back to let another pass.

THE SLANT BOARD.

Slant Board

This should be seized with both hands, the feet being placed in the middle. The board should be considerably aslant when first attempted, and gradually brought towards the perpendicular.

VAULTING.

This exercise may be practised on that part of the balancing bar between the posts. It may be performed with or without running: it should, however, be commenced with a short run. The height should be, to commence, about the pit of the stomach, which should be increased to the height of the individual.

BALANCING.

There are two kinds of balancing to which we shall allude; namely, the balancing of other bodies, and the balancing of our own.

Balancing

All feats of balancing depend upon the centre of gravity being uniformly preserved in one position. The centre of gravity is that point, about which all the other parts exactly balance each other. If a body be freely suspended upon this point, it will rest with security, and as long as this point is supported, it will never fall, while in every other position it will endeavour to descend to the lowest place at which it can arrive. If a perpendicular line were drawn from the centre of gravity of a body to the centre of the earth, such a line would be termed the line of direction, along which every body supported endeavours to fall. If this line fall within the base of a body, such a body will be sure to stand.

When the line of direction is thrown beyond its centre, unless the base be enlarged to counterbalance it, the person or body will fall. A person in stooping to look over a deep hole, will bend his trunk forward; the line of direction being altered, he must extend his base to compensate for it, which he does by putting his foot a step forward. A porter stoops forward to prevent his burthen from throwing the line of direction out of the base behind, and a girl does the same thing in carrying a pail of water, by stretching out her opposite arm, for the weight of the pail throws the centre of gravity on one side, and the stretching out of the opposite arm brings it back again, and thus the two are balanced. The art of balancing, therefore, simply consists in dexterously altering the centre of gravity upon every new position of the body, so as constantly to preserve the line of direction within the base. Rope-dancers effect this by means of a long pole, held across the rope; and when the balancing-rail is mounted, it will be found necessary to hold out both the arms for the same purpose; nay, even when we slip or stumble with one foot, we in a moment extend the opposite arm, making the same use of it as the dancer does of his pole.

Balancing

A balancer finds that a body to be balanced, is the best for his purpose if it have a loaded head, and a slender or pointed base, for although the higher the weight is placed above the point of support, the more readily will the line of direction be thrown beyond the base, yet he can more easily restore it by the motion of his hand,—narrowly watching with his eyes its deviations. Now the same watchfulness must be displayed by the gymnastic balancer: he first uses the balancing pole,—he then mounts the balancing bar without it. On mounting the bar, the body should be held erect, and the hands must be extended. He must

then learn to walk firmly and steadily along the bar, so as to be able to turn round, and then he should practise going backwards. Two balancers should then endeavour to pass each other on the bar; afterwards, to carry each other, and bodies of various weights, in various positions.

Walking on stilts is connected with balancing. A person can walk with greater security upon high than on low stilts. In some parts of France, the peasantry, in looking after their sheep, walk generally on stilts, and it only requires practise to make this as easy as common walking. Some few years ago, several of these stilt-walkers were to be seen in London, and they could run, jump, stoop, and walk with ease and security, their legs seeming quite as natural to them as those of the Stork.

Tailpiece

PART V.

CRICKET.

Cricket

Cricket is the king of games. Every boy in England should learn it. The young prince of Wales is learning it, and will some day be the prince of cricket-players, as I trust he will some day, a long while hence, however, let us hope, be king of merry England. I shall, therefore, be very particular concerning this noble game. It is played by a bat and ball, and consists of double and single wicket. The wicket was formerly two straight thin batons, called stumps, twenty-two inches high, which were fixed in the ground perpendicularly, six inches apart, and over the top of both was laid a small round piece of wood, called the bail, but so placed as to fall off readily if the stumps were touched by the ball. Of late years the wicket consists of three stumps and two bails; the middle stump is added to prevent the ball from passing through the wicket without beating it down; the external stumps are now seven inches apart, and all of them three feet two inches high. Single wicket requires five players on each side, and double wicket eleven; but the number in both instances may be varied at the pleasure of the two parties. At single wicket the striker with his bat is the protector of the wicket; the opponent party stands in the field to catch or stop the ball; and the bowler, who is one of them, takes his place by the side of a small baton or stump, set up for that purpose, twenty-two yards from the wicket, and thence delivers the ball with the intention of beating it down. It is now usual to set up two stumps with a bail across, which the batsman, when he runs, must beat off before he returns home. If the bowler prove successful, the batsman retires from the play and another of his party succeeds; if, on the contrary, the ball is struck by the bat, and driven into the field beyond the reach of those who stand out to stop it, the striker runs to the stump at the bowler's station, which he touches with his bat, and then returns to his wicket. If this be performed before the ball is thrown back, it is called a run, and a notch or score is made upon the tally towards the game; if, on the contrary, the ball be thrown up and the wicket beaten down by the opponent party before the striker is home or can ground his bat within three feet ten inches of the wicket (at which distance a mark is made in the ground, called the *popping crease*), he is declared to be out, and the run is not reckoned. He is also out if he strike the ball into the air and it is caught by any of his antagonists before it reaches the ground, and retained long enough to be thrown up again.

When double wicket is played, two batsmen go in at the same time,—one at each wicket: there are also two bowlers, who usually bowl four balls in succession alternately. The batsmen are said to be in as long as they remain at their wickets, and their party is called the *in-party*; on the contrary, those who stand in the field with the bowlers, are called the *out-party*. Both parties have two innings, and the side that obtains the most runs in the double contest, claims the victory. These are the general outlines of this noble pastime, but there are many particular rules and regulations by which it is governed, and these rules are subject to frequent variations.

SINGLE WICKET.

Single wicket may be played with any number of players, and is better than double wicket for any number of players under seven. At double wicket, a small number of players would get so fatigued with running after the ball, that when it came to the last player's turn, he would find himself too tired, without resting a while. The first innings in single wicket must be determined by chance. The bowler should pitch the wickets, and the striker measure the distance for the bowling-stump. Measure a distance of the length of the bat, and then one of the striker's feet, from the middle stump in a direction towards the bowling stump: there make a mark, which is the same as the popping-crease, and this will show when you are on the ground; place your bat upright on the mark at the place where the measure came to, and ask the bowler whether your bat is before the middle of your wicket; here make a mark on the ground, which is generally called the blocking-hole.

The bowler now begins to bowl, and the striker should endeavour to hit any ball which comes within his compass, or if the ball given be not favourable for that purpose, he may block it; but in blocking he must be careful never to let the tip of the bat come before the handle, as the ball in such a case will probably rise in the air towards the bowler, and he will be caught out. In running, the striker must touch the bowling-stump with his bat or person, or it is no run, and he may be put out if he do not put his bat or some part of his person on his ground before the ball touches his wicket.

With three players, the bowler and striker will be the same as when two are at play; the second player will be fieldsman, who, when the ball be hit nearer to

him than to the bowler, will pick it up, or catch it if he can, and return it to the bowler. If the striker should attempt to run, the bowler should immediately run to the wicket, and the fieldsman should throw the ball to him, so that he may catch it, and touch the wicket with it to get the striker out. When the first striker is out, the fieldsman will take his place, the striker will bowl, and the bowler will take the field. When four players are engaged, the fourth should stand behind the wicket; and when five or more play, the additional players should take the field. The rule in such a case is simply, that as soon as a striker is out he becomes bowler, then he becomes wicket-keeper, and then he takes his place in the field on the left of the bowler, and afterwards the other places in regular progression, until it is his turn to have a new innings.

LAWS OF THE GAME OF DOUBLE WICKET.

"Law, is law," said Evergreen; "laws must be rigidly obeyed, and, therefore, I will read the articles of war for your edification. The first article of war is said to be, 'That it shall be death to stop a cannon-ball with your head.'" Cricketers must be cautious also how they stop cricket-balls with this part of the body: but

Imprimis, the BALL must be in weight between five ounces and a half and five ounces and three quarters, and must be between nine inches and nine inches and one-eighth in circumference.

2. The BAT must not be more than thirty-eight inches in length, nor exceed four inches and a quarter in its widest part.

3. The STUMPS, which are three to each wicket, must be twenty-seven inches out of the ground, and placed so closely as not to allow the ball to pass through. The bails must be eight inches in length.

4. The BOWLING-CREASE must be in a line with the stumps, and six feet eight inches in length, the stumps in the centre, with a return-crease at each end towards the bowler at right angles.

5. The POPPING CREASE must be three feet ten inches from the wicket, and parallel to it, unlimited in length, but not shorter than the bowling-crease.

6. They must be opposite to each other, twenty-two yards apart.

7. It is not lawful for either party, during a match, without the other party gives consent, to make any alteration in the ground by rolling, watering, covering, mowing, or beating.

This rule is not meant to prevent the striker from beating the ground with his bat near to the spot where he stands during the innings, nor to prevent the bowler from filling up holes with sawdust, &c., when the ground is wet.

8. After rain, the wickets may be changed with the consent of both parties.

Cricket

THE BOWLER.

9. The bowler must deliver the ball with one foot behind the bowling-crease, and bowl four bowls before he changes wickets, which he is permitted to do, once only, in the same innings.

10. The ball must be bowled; if it be thrown or jerked, or if the hand be above the shoulder in the delivery, the umpire must call "no ball" (this being reckoned as one of the four balls).

11. In some matches, the bowler may give six balls where the parties are agreed. The bowler may order the striker at the wicket from which he bowls, to stand on which side of it he pleases.

12. Should the bowler toss the ball over the striker's head, or bowl it so wide that it shall be out of distance to be played at, the umpire, although the striker attempt it, shall adjudge one run to the parties receiving the innings, either with or without an appeal from them, which shall be put down to the score of wide balls, and such balls shall not be reckoned as any of the four balls. When the umpire shall have called "wide ball," one run only shall be reckoned, and the ball shall be considered dead.

13. If "no ball" be called by the umpire, the hitter may strike at it, and is allowed all the runs he can make, and is not be considered out except by running out. Should no run be obtained by any other means, then one run shall be scored.

14. When a fresh bowler takes the ball, only two balls shall be allowed for practice; he must, however, continue the next four in the game before he can change for another better approved. If six balls are agreed to be bowled, then he must continue the six instead of four.

15. No substitute in the field shall be allowed to bowl, keep wicket, STAND AT THE POINT OR MIDDLE WICKET, except by mutual agreement of the parties.

THE STRIKER.

Is OUT, if either of the bails be struck off by the ball, or either of the stumps struck out of the ground.

He is OUT, if the ball, from a stroke of the bat or hand below the wrist, be held by his adversary before it touches the ground, although hugged or caught between the arms and breast of the catcher.

He is OUT, if in striking, or at any other time while the ball is in play, both his feet be over the popping-crease, and his wicket put down, except his bat be grounded within it.

He is OUT, if in striking at the ball, he either with his bat, clothes, or person, hits down his wicket.

He is OUT, if under pretence of running a notch, or otherwise, either of the strikers prevent a ball from being caught, or if the ball be struck up and he wilfully strikes it again.

He is OUT, if in running a notch the wicket be struck down by a throw, or with the hand or arm with ball in hand, before his bat is grounded over the popping-crease. If the bails should happen to be off, a stump must be struck out of the ground.

He is OUT, should he take up or touch the ball while in play, unless at the request of the opposite party.

He is OUT, if with a part of his person he stop the ball, which the bowler, in the opinion of the umpire at the bowler's wicket, has pitched in a straight line with the wicket.

If the players have *crossed* each other, he that runs for the wicket that is put down, is out; and if they have *not crossed*, he that has left the wicket which is put down, is out.

When a ball is caught, no run is to be reckoned.

When a striker is run out, the notch they were running for is not to be reckoned.

If "lost ball" shall be called, the striker is allowed the runs; but if more than six shall have been run before "lost ball" shall have been called, then the striker shall have all that have been run.

When the ball has been lodged in the wicket-keeper's or bowler's hands, it is considered *dead*, that is, no longer in play, and the striker need not keep within ground, till the umpire has called "play;" but if the player goes off his ground, with intent to run, the bowler may put him out.

Should the striker be hurt, he may retire from his wicket and return to it any time during that innings. Some other person may stand out for him, but not go in.

If any person stop the ball with his bat, the ball is to be considered as *DEAD*, and the opposite party to add five notches to their score.

If the ball be struck up, the striker may guard his wicket with his bat or any part of his body except his *hand*.

If the striker hit the ball against his partner's wicket when he is off his ground, he is out, should it previously have touched the bowler or any of the fieldmen's hands, but not otherwise.

THE WICKET-KEEPER.

The wicket-keeper should not take the ball for the purpose of stumping, until it have passed the wicket. He shall stand at a proper distance behind the wicket, and shall not move till the ball be out of the bowler's hand. He shall not by any noise, incommode the striker, and if any part of his person be over or before the wicket, although the ball hit it, he shall not be out.

THE UMPIRES.

The umpires are the sole judges of fair and unfair play, and all disputes are determined by them, each at his own wicket. They shall not stand more than six yards from the wicket. In case of a catch, which the umpire at the wicket cannot see sufficiently to decide upon, he may apply to the other umpire, whose opinion is conclusive.

The umpires shall pitch fair wickets, and the parties shall toss up for the choice of innings.

They shall allow two minutes for the striker to come in, and fifteen minutes between each innings. When the umpires shall call "play," the party who refuses shall lose the match.

They are not to order a player out unless assented to by the adversaries.

If the bowler's foot be not behind the bowling-crease and within the return crease when he delivers the ball, they must, unasked, call "no ball;" if the striker run a short run, the umpire must call "no run."

If in running either of the strikers shall fail to ground his bat, in hand, or some part of his person, over the popping crease, the umpire, for every such failure, shall deduct two runs from the number intended to have been run, because such striker, not having run in the first instance, cannot have started in the second from the proper goal.

No umpire is allowed to bet.

No umpire to be changed during a match, unless with the consent of both parties, except in case of a violation of the last law, then either party may dismiss the transgressor.

After the delivery of four balls, the umpire should call "over," but not until the ball shall be lodged and definitely settled in the wicket-keeper's or bowler's hand; the ball shall then be considered dead. Nevertheless, if an idea be entertained that either of the strikers is out, a question may be put previously to, but not after the delivery of the next ball.

The umpire must take especial care to call "no ball" instantly upon delivery, and "wide ball," as soon as ever it shall pass the striker.

LAWS FOR SINGLE WICKET.

1. When there shall be less than four players on a side, bounds shall be placed, twenty-two yards each, in a line from the off and leg stump.
2. The ball must be hit before the bounds to entitle the striker to a run, which run cannot be obtained unless he touch the bowling-stump or crease, in a line with it, with his bat or person, or go beyond them, returning to the popping-crease, as in double wicket, according to the law.
3. When the striker shall hit the ball, one of his feet must be on the ground behind the popping-crease, otherwise the umpire shall call "no hit."
4. When there shall be less than five players of a side, neither byes nor overthrows shall be allowed, nor shall the striker be caught out behind the wicket, nor stumped out.
5. The fieldsman must return the ball so that it shall cross the space between the wicket and the bowling stump, or between the bowling stumps and the bounds; the striker may run till the ball be so returned.
6. After the striker has made one run, he must touch the bowling stump, and run before the ball shall cross the play, to entitle him to another.
7. The striker shall be entitled to three runs for lost ball, and the same number for ball stopped with bat.
8. When there shall be more than four players to a side, there shall be no bounds; all *hits*, *byes*, and *overthrows*, will then be allowed.
9. The bowler is subject to the same laws as at double wicket.
10. No more than one minute shall be allowed between each ball.

BETS.

1. No bet is payable in any match unless it be played out or given up.

2. If the runs of one player be betted against those of another, the bet depends on the first innings, unless otherwise specified.
3. If the bet be made upon both innings, and one party beats the other in one innings, the runs in the first innings shall determine it.
4. If the other party go in a second time, then the bet must be determined by the number in the second.

OBSERVATIONS.

Cricket is played by twenty-two persons, eleven on each side, and two umpires, with two persons to score and count the innings. Thirteen players play at one time, viz., two strikers, one bowler, one wicket-keeper, long-stop, short-stop, point, cover, middle-wicket, long-field, off-side, on-side, and leg; of these the two strikers are the inside, or have their innings. The object of the game is to get the greatest number of runs, and this is to be done by the strikers. Each side having been in once and out once, the first innings is concluded, and, we might say, a complete game has been played, but in most matches another innings is played. The scorers keep the account of runs to each striker separately for each innings. The side that has obtained the greatest number of runs, wins the game. The arrangement of the players in the field is as follows:—

Order Of The Players

ORDER OF THE PLAYERS.

1. Striker.
 2. Bowler.
 3. Wicket-keeper.
 4. Long-stop.
 5. Short-stop.
 6. Long-slip.
 7. Point.
 8. Cover.
 9. Middle-wicket.
 10. Long-field, off-side.
 11. Long-field, on-side.
 12. Leg.
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PART VI.

SWIMMING.

Swimming

No boy should be unable to swim, because it is essential to the preservation of life; but the attainment of the art has been held to be difficult, and the number of good swimmers is very small. The whole science of swimming consists in multiplying the surface of the body by extensive motions, so as to displace a greater quantity of liquid. As the first requisite of oratory was said to be action; the second, action; and the third, action; so the first, second, and the third requisite in learning to swim, is COURAGE. Now there is a vast difference between courage and temerity; courage proceeds from confidence, temerity, from carelessness; courage is calm and collected, temerity is headstrong and rash; courage ventures into the water carefully, and throws himself off with a firm and vigorous lounge forward, and a slow and equable stroke; temerity begins to dive before he knows whether he can swim or sink, and after floundering about for a minute or two, finds that he can swim farthest where it is deepest. Therefore, let the young swimmer mark the distinction between courage and temerity, and he will speedily become a swimmer.

Before, however, we proceed to offer any remarks on swimming as an art, we cannot refrain from calling the attention of our young friends to the observations of a celebrated medical doctor who has thought profoundly on the subject. "Immersion in cold water," says he, "is a custom which lays claim to the most remote antiquity; indeed it must be coeval with man himself. The necessity of water for the purpose of cleanliness, and the pleasure arising from its application in hot countries, must have very early recommended it to the human species; even the example of other animals was sufficient to give the hint to man; by instinct many of them are led to apply cold water in this manner, and some, when deprived of its use, have been known to languish, and even to die."

The cold bath recommends itself in a variety of cases, and is peculiarly beneficial to the inhabitants of populous cities who indulge in idleness and lead sedentary lives: it accelerates the motion of the blood, promotes the different secretions, and gives permanency to the solids. But all these important purposes will be more easily answered by the application of salt water; this also ought not only to be preferred on account of its superior gravity, but also, "for its greater

power of stimulating the skin, which prevents the patient from catching cold."

It is necessary, however, to observe, that cold bathing is more likely to prevent than to remove obstructions of the glandular or lymphatic system; indeed, when these have arrived at a certain height, they are not to be removed by any means; in this case, the cold bath will only aggravate the symptoms, and hurry the unhappy patient into an untimely grave. It is, therefore, of the utmost importance, previously to the patient entering upon the use of the cold bath, to determine whether or not he labours under any obstinate obstruction of the lungs or other viscera, and when this is the case, cold bathing ought strictly to be prohibited.

In what is called a plethoric state, or too great fulness of the body, it is likewise dangerous to use the cold bath without due preparation. In this case, there is danger of bursting a blood-vessel, or occasioning an inflammation.

The ancient Romans and Greeks, we are told, when covered with sweat and dust, used to plunge into rivers without receiving the smallest injury. Though they might escape danger from this imprudent conduct, yet it was certainly contrary to sound reason; many robust men have thrown away their lives by such an attempt. We would not, however, advise patients to go in the cold water when the body is chilled; as much exercise at least ought to be taken as may excite a gentle glow all over the body, but by no means so as to overheat it.

To young people, and particularly to children, cold bathing is of the utmost importance; it promotes their growth, increases their strength, and prevents a variety of diseases incident to childhood.

It is necessary here to caution young men against too frequent bathing, as many fatal consequences have resulted from the daily practice of plunging into rivers, and continuing there too long.

The most proper time of the day for using the cold bath is, no doubt, the morning, or at least before dinner, and the best mode, that of quick immersion. As cold bathing has a tendency to propel the blood to the head, it ought always to be a rule to wet that part as soon as possible. By due attention to this circumstance, there is reason to believe that violent head-aches, and other complaints which frequently proceed from cold bathing, might be often prevented.

The cold bath, when too long continued, not only occasions an excessive flux towards the head, but chills the blood, cramps the muscles, relaxes the nerves, and wholly defeats the intention of bathing; hence expert swimmers are often injured, and sometimes lose their lives. All the beneficial purposes of cold bathing are answered by one immersion at a time, and the patient ought to be rubbed dry the moment he comes out of the water, and should continue to take exercise some time after.

Doctor Franklin, who was almost always a practical man, says, "that the only obstacle to improvement in this necessary and life-preserving art, is fear; and it is only by overcoming this timidity, that you can expect to become a master of the following acquirements. It is very common for novices in the art of swimming, to make use of corks or bladders to assist in keeping the body above the water; some have utterly condemned the use of them. However, they may be of service for supporting the body while one is learning what is called the stroke, or that manner of drawing in and striking out the hands and feet that is necessary to produce progressive motion; but you will be no swimmer till you can place confidence in the power of the water to support you. I would therefore advise the acquiring that confidence in the first place, as I have known several who, by a little practice necessary for that purpose, have insensibly acquired the stroke, taught as if it were by nature. The practice I mean, is this—choosing a place where the water deepens gradually, walk coolly in it until it is up to your breast, then turn your face towards the shore and throw an egg into the water between you and the shore, it will sink to the bottom and will easily be seen there if the water is clear; it must lie in the water so deep that you cannot reach to take it up without diving for it. To encourage yourself to do this, reflect that your progress will be from deep to shallow water, and that at any time you may, by bringing your legs under you and standing on the bottom, raise your head far above the water; plunge under it with your eyes open, which must be kept open before going under, as you cannot open your eyelids from the weight of water above you, throw yourself towards the egg and endeavour by the action of your feet and hands against the water, to get forward till within reach of it. In this attempt you will find that the water buoys you up against your inclination, and that it is not so easy to sink as you imagine, and that you cannot, but by active force, get down to the egg. Thus you feel the power of water to support you, and learn to confide in that power, while your endeavours to overcome it and to reach the egg, teach you the manner of acting on the water with your feet and hands, which action is afterwards used in swimming to support your head higher above the water, or to go forward through it.

"I would the more earnestly press upon you the trial of this method, because, though I think I shall satisfy you that your body is lighter than water, and that you might float for a long time with your mouth free for breathing, if you would put yourself into a proper posture, and would be still and forbear struggling, yet till you have obtained this experimental confidence in the water, I cannot depend upon your having the necessary presence of mind to recollect the posture and the directions I gave you relating to it; the surprise may put all out of your mind.

"Though the legs, arms, and head of a human body, being solid parts, are specifically somewhat heavier than fresh water, yet the trunk, particularly the upper part, from its hollowness, is so much lighter than water, as that the whole of the body, taken altogether, is too light to sink wholly under water, but that some parts will remain above until the lungs become filled with water, which happens from drawing water to them instead of air, when a person in the fright attempts breathing while the mouth and nostrils are under water.

"The legs and arms are specifically lighter than salt water, and will be supported by it, so that a human body cannot sink in salt water, though the lungs were filled as above, but for the greater specific gravity of the head. Therefore, a person throwing himself on his back in salt water, and extending his arms, may easily lie so as to keep his mouth and nostrils free for breathing, and by a small motion of the hand may prevent turning if he should perceive any tendency to it.

"In fresh water, if a man throw himself on his back near the surface, he cannot continue in that situation but by proper action of his hands in the water; if he have no such action, the legs and lower part of the body will gradually sink till he comes into an upright position, in which he will continue suspended, the hollow of his breast keeping the head uppermost.

"But if in this erect position, the head be kept upright above the shoulders, as when we stand on the ground, the immersion will, by the weight of that part of the head that is out of the water, reach above the mouth and nostrils, perhaps a little above the eyes, so that a man cannot long remain suspended in the water with his head in that position.

"The body continuing suspended, as before, and upright, if the head be leaned quite back, so that the face look upward, all the back part of the head being under water, and its weight consequently being in a great measure supported by it, the face will remain above water quite free for breathing, will rise an inch

higher at every inspiration, and sink as much at every expiration, but never so low that the water may come over the mouth.

"If, therefore, a person unacquainted with swimming, falling into the water, could have presence of mind sufficient to avoid struggling and plunging, and to let the body take this natural position, he might continue long safe from drowning, till, perhaps, help should come; for as to the clothes, their additional weight, when immersed, is very inconsiderable, the water supporting them, though when he comes out of the water he would find them very heavy indeed.

"But, as I said before, I would not advise you or any one to depend on having this presence of mind on such an occasion, but learn fairly to swim, as I wish all men were taught to do in their youth: they would on many occasions be the safer for having that skill, and on many more, the happier, as being free from painful apprehensions of danger, to say nothing of the enjoyment in so delightful and wholesome an exercise. Soldiers, particularly, should all be taught to swim; it might be of particular use either in surprising an enemy or saving themselves, and if I had any boys to educate, I would prefer those schools in which an opportunity was afforded for acquiring so advantageous an art, which when once learned, is never forgotten.

"I know by experience, that it is a great comfort to a swimmer who has a great distance to go, to turn himself sometimes on his back, and to vary in other respects the means of procuring a progressive motion.

"When he is seized with the cramp in the leg, the method to drive it away, is to give the parts affected a sudden, vigorous and violent shock, which he may do in the air as he swims on his back.

"During the great heats in summer, there is no danger in bathing, however warm he may be, in rivers which have been thoroughly warmed by the sun; but to throw one's-self into cold spring water when the body has been heated by exercise in the sun, is an imprudence which may prove fatal. I once knew an instance of four young men, who, having worked at harvest in the heat of the day, with a view of refreshing themselves, plunged into a spring of cold water; two died upon the spot, a third next morning, and the fourth recovered with great difficulty. A copious draught of cold water, in similar circumstances, is frequently attended with the same effect in North America.

"When I was a boy, I amused myself one day with flying a paper kite, and approaching the bank of a lake which was near a mile broad, I tied the string to a stake, and the kite ascended to a very considerable height above the pond while I was bathing. In a little while, being desirous of amusing myself with my kite and enjoying at the same time the pleasure of swimming, I returned, and loosening from the stake the string with the little stick which was fastened to it, went again into the water, where I found, that by lying on my back and holding the stick in my hand, I was drawn along the surface of the water in a very agreeable manner. Having thus engaged another boy to carry my clothes round the pond to a place which I pointed out to him on the other side, I began to cross the pond with my kite, which carried me quite over without the least fatigue and with the greatest pleasure imaginable. I was only obliged occasionally to halt a little in my course and resist its progress, when it appeared that by following too quick I lowered the kite too much; by doing thus occasionally, I made it rise again. I have never since that time practised this singular mode of swimming, though I think it not impossible to cross in this manner from Dover to Calais. The packet boat is, however, preferable."

PRELIMINARY EXERCISES IN SWIMMING.

We have shown that much of the art of swimming depends upon having confidence, and that that confidence is speedily dissipated upon the swimmer coming in contact with the water. Besides this, a great deal in the art of swimming depends upon the degree of ease with which the swimmer can use his hands and feet. Now this sort of exercise may in part be acquired on land, and it would be of great usefulness to the learner were he to enter upon some preliminary practice which would give him the use of his hands and feet, in the manner required in swimming. To do this, he should provide himself with two ropes, which should be fastened up in the manner of two swings, at about sixteen inches apart from each other, and one a little higher than the other; these should be joined together with two or three cords passing from the one to the other, and on the rack thus made, a pillow or cushion should be placed; upon this, the learner will throw himself on his breast, as upon the water, and supporting himself in this position, and having his hands and feet perfectly at liberty, he will move them to and fro in the same manner as in swimming; this he should repeat several times a day, until he finds that he has got a complete mastery over the action required. The head must be drawn back, the chin raised, the fingers must

be kept close, and the hands slightly concave on the inside,—they must be struck out in a line with the breast; the legs must then be drawn up and struck out, not downwards, however, but *behind*, in such a manner, that they may have a good hold upon the water. These directions being followed for a few days, will give the learner so much assistance, that when he enters the water he will find little more requisite than calmness and confidence in striking out.

Using Bladders And Corks

In proceeding to take water, the first thing the youth should do, is to make himself thoroughly convinced that the spot is safe, that there are no holes in it, that no weeds are at the bottom, that it does not contain any stones likely to cut the feet. He must also be cautious that he does not enter a stream whose eddy sweeps round a projecting point, or hollow; the bank should slope off gradually, so that he may proceed for ten or twelve yards from the shore, before the water rises to the level of his armpits. With regard to the use of bladders and corks, although it may perhaps be better to learn to keep ourselves afloat without their aid, yet they may be used with advantage, if used sparingly. The pupil, in using them, places his breast across the rope which unites them, so that when he lays himself over them in the water, they float above him, and thus assist in buoying him up; thus sustained, he strikes out and propels himself with his hands and feet. In striking out when in the water, the fingers are to be perfectly straight, and the thumb kept close to the hand; the hands are then to be brought forward, palm to palm, and to be thrust out in a direction on a level with the chin; when at their fullest reach, they are to be parted and swept slowly and regularly with the palms in a horizontal position, the full stretch of the arms backwards, they are then brought up from the hips and struck out forward, as before. While the hands are near the hips, is the time for the legs to perform their part; they are to be drawn up as near to the body as possible, and the soles of the feet struck against the water with moderate force, immediately the hands are again thrust forward. Now all this is very easily performed with a little practice, but will be very difficult if the learner have not coolness and self-possession. A slow long stroke, the hand thrust forward with energy, and the legs brought up and struck out with a regular and even stroke, is the whole art of simple swimming. The swimmer must, however, be careful to draw his breath at the time when his hands are descending towards his hips; if he attempt it when he strikes out his legs, his head will partially sink, and his mouth will fill with water. The breath should accordingly be expired while the body is sent forward by the action of the legs.

Using A Plank

The young swimmer will find much use in having a plank, ten feet long, two inches thick, and a foot broad, which he may take hold of at one of its ends, and his body being thus supported he will perfect himself in the action of the legs, and will, by striking them out, drive the plank before him: he must, however, take care to hold it fast, for if he should let go his hold, he will find himself sinking over head and ears in the water. A rope may also be so fixed as to reach over the water, by which the swimmer may support himself while learning to strike out with his legs; but he should be careful always in performing this exercise, to keep his legs near the surface, as, if the legs drop down, he will make very little way in the water. One of the best kinds of assistance, however, the young swimmer can have, is the hand of some one who is willing to teach him, and is superior to any other methods for very young swimmers. If a grown person will take the trouble to take the little learner out with him till he is breast high in the water, and sustain him with one hand under the breast, and occasionally hold him up by the chin, at the same time directing and encouraging him, and occasionally letting him loose that he may support himself by striking out, the little learner will soon reach that triumphant period when he floats alone on the water.

After this triumph, however, the young swimmer must be exceedingly cautious, though he may feel conscious of his own power, he must venture only a few strokes out of his depth: should he be in a broad river, he must be careful not to do so where there is a strong curling eddy or flood: in a small river, the breadth of which is only a few yards, he may venture across with a few bold and regular strokes; but should he become flurried and lose his time, he will most assuredly be in danger of sinking. Let him then obtain such perfect command over his limbs, and also over himself, that when he ventures out of his depth, he may be able to keep afloat in the water, pleasantly to himself, and without hazard.

Floating

A most important branch in art of swimming, is floating, as the swimmer may frequently rest himself when fatigued, and otherwise engage himself in the water. To do this, he must turn himself as gently as possible on the back, put his head back, so that his eyes, mouth, and chin, only, are above the water, elevate his breast, and inflate his chest as much as possible: the arms may be brought towards the hips, and the hands should be paddled in a horizontal kind of sweep,

which will sustain the body. Should the learner wish to swim, he must strike out with his legs, taking care not to lift his legs too high; in this position the arms may occasionally be folded across the breast.

Treading Water

To *tread water*, the legs must be suffered to drop in the water till the swimmer finds himself upright, he then treads downwards with his feet, occasionally paddling with the palms of his hands. The swimmer, when long in the water, will soon find himself tired, changes of action are therefore necessary; there are many which are highly advantageous to learn, such as swimming like a dog, porpoise, etc. To *swim like a dog*, he must strike with each hand and foot alternately, beginning with the right hand and foot, he must draw the hand towards the chin, and the foot towards the body, at the same time; he then must kick backwards with the foot, and strike out in a right line with the hand, and the same with the left hand and foot: the palms of the hands must be hollow, and the water pulled towards the swimmer. In *swimming like a porpoise*, the right arm is lifted entirely out of the water, the shoulder is thrust forward, and while the swimmer is striking out with his legs, he reaches forward with his hand as far as he can; his hand then falls, a little hollowed, in the water, which it grasps or pulls towards him in a transverse direction towards the other armpit. While this is going on, the legs are drawn up for another effort, and the left arm and shoulder are raised and thrust forward, as the right had previously been. When the swimmer feels tired, he may change these positions for swimming on the side. To do this, he must lower his left side and elevate his right, striking forward with his left hand, and sideways with his right, the back of the hand being in front instead of upward, the thumb side of the hand being downward so as to serve as an oar. Should the swimmer wish to turn on his back, he must keep one leg still, and embrace the water beside him with the other, and he will turn to that side. To shew the feet, he must turn himself on his back, and bend the small of it downwards, supporting himself by his hands to and fro immediately above his breast, and hold his feet above the water. Swimming under water is performed by the usual stroke, the head being kept a little downwards, and the feet struck out a little higher than when swimming on the surface.

BERNARDI'S SYSTEM.

Upright swimming.—This is a new mode of swimming, introduced by Bernardi, a Neapolitan, and consists in adopting the accustomed motion of the limbs in

walking. It gives great freedom to the hands and arms, affords a greater facility of breathing and of sight. It is true, that a person swimming in an upright position, advances more slowly, but as the method is more natural, the person is able to continue his course longer, and can remain with greater safety in the water.

The first object with Bernardi, is to enable the pupil to float in an upright position, and in this the head is made the great regulator of all the motions. After having been by practice familiarised to keep his equilibrium, a variety of motions are gradually practised, until the swimmer is enabled at every stroke to urge himself forward a distance equal to the length of his body, and to travel, without fatigue, at least three miles an hour, and to continue this without great fatigue for many hours. Bernardi, speaking of the success of his practice, says, "Having been appointed to instruct the youths of the Royal Naval Academy at Naples in the art of swimming, a trial of the pupils took place in the presence of a number of persons assembled on the shore, and under the inspection of authorities appointed to witness and report upon the experiment. A twelve-oared boat attended the progress of the pupils, from motives of precaution. They swam so far out in the bay, that at length the heads of the young men could with difficulty be discerned with the naked eye; and the Major-General of Marine, Fortguerri, for whose inspection the exhibition was attended, expressed serious apprehensions for their safety. Upon their return to the shore, the young men, however, assured him that they felt so little exhausted, as to be willing immediately to repeat the exertion."

After devoting a month to the investigation of Bernardi's plan, the Neapolitan government state in their official report—

"That it has been established by the experience of more than a hundred persons of different bodily constitutions, that the human body is lighter than water, and, consequently, will float by nature, and that the art of swimming must be acquired to render that privilege useful.

"That Bernardi's system is new, in so far as it is founded on the principle of husbanding the strength, and rendering the power of recruiting it easy."

The speed, according to the new method, is no doubt diminished, but security is much more important than speed, and the new plan is not exclusive of the old when occasions require great effort.

Little more need be said on the subject of swimming, except giving a few directions in diving and plunging, which require to be performed with caution and elegance. When the swimmer prepares to dive, he must take a full inspiration of air, the eyes must be kept open, the back made round, and the head bent forwards on the breast; the legs must be thrown out with force, and the arms and hands, instead of being struck forward as in swimming, must move backward. When the swimmer would ascend, the chin must be held up, the back bent inwards, the hands struck out high and brought sharply down, and the body will immediately rise to the surface of the water.

Deep Plunge

Flat Plunge

Plunging.—There are two different modes of plunging to be acquired, namely, the flat plunge, which is necessary in shallow water, and the deep plunge, which is used where there is considerable depth of water. For the latter, the arms must be outstretched, the knees bent, and the body leant forward till the head descends nearly to the feet when the spine and knees are extended. In the flat plunge, the swimmer must fling himself forward in an inclined direction, according to the depth or shallowness of the water; when he touches the bottom, he must rise in the same manner as after diving.

After all these necessary motions and movements have been acquired in the water, there is one thing of which the swimmer must beware, and against which art and precaution can do but little—this is the CRAMP. When this seizes the swimmer, he must endeavour, as much as possible, to avoid being alarmed, as he will reflect, that as the body is lighter than water, a very little exertion in it will keep his body afloat. Of course his first thoughts will be towards the shore, but he must not forget, that the cramp being only a muscular contraction, may be thrown off by proper muscular exertion. He must strike out the limb violently, and bringing the toes towards the shin-bone, thrust his feet out, which will probably restore the muscles to their proper exercise; but if the cramp still continue, he can easily keep himself afloat with his hands, and paddle towards the shore, till some assistance comes to him. If one leg is only attacked, he may drive himself forward with the other, and for this purpose, in an emergency, the swimmer should frequently try to swim with one hand, or one leg and one hand, or by two hands alone, which will be easily acquired.

Should a companion be in danger of drowning, it is our duty to use every exertion to save his life; and, indeed, not to use the utmost exertion is a high degree of moral guilt, but in doing this, we must not rashly hazard our own life, nor put ourselves into a position in which the swimmer can cling to us or grasp any part of our body, or the loss of both will be inevitable. It will be better in all cases where bathing is practised, that there should be ropes and planks at hand, and young swimmers should never venture far into the water without such means of rescue are available. In conclusion, we would caution all who go into the water, against remaining in it too long, as nothing can be more dangerous; and we would further advise that the practice of bathing and swimming be not only common to boyhood, but be continued in after life, as few things tend more to the preservation of HEALTH.

Tailpiece

PART VII.

GARDENING.

We read in the sacred records, that when man was created, he was placed in a "Garden,"—the Garden of Eden, to dress it and to keep it; and we may infer therefrom, first, that, the occupation of gardening was one pre-eminently fitted for the happiness of man, and secondly, that industry, and even labour, was also a part of man's duty, even in a state of innocence.

There is not a more innocent amusement than gardening. Nothing can be more lovely than to be among buds and fruits and flowers; nothing is more conducive to health and peace of mind, and few things are better calculated to inspire religious feelings than gardening.

Every little boy or girl should have a garden, and should be shown how to manage it. There is a great deal in *management* and in *method* at all times, but especially in gardening. Much *attention* is also necessary,—great *care* and much *forethought*; all of which qualities of the mind it is in the highest degree proper to train and exercise. Whoever, therefore, begins gardening, must not look upon it as an idle sport, to be taken up and thrown aside with the whim of the moment, but as an occupation for leisure hours, that the mind must be brought to bear upon, and which must engage him from day to day, from month to month, from spring to summer, from autumn to winter, and so through all the changes of the varied year.

Gardening

LAYING OUT THE GROUND.

Garden Layout

To begin gardening, a little boy must have some *ground*, which is quite indispensable; and a boy of from ten to fourteen years old ought to have, at least, a piece large enough for him to divide and subdivide, and arrange with neatness and order. A piece of about forty yards long by thirty wide will be large enough to commence with, and this should be set out in the subjoined manner. This will

allow of a path three feet wide in the centre, and of one two feet six inches round the sides, leaving the beds twenty-two and a half feet wide. The paths should be gravelled with a good red binding gravel, and to look nice, the borders should be edged with box or edging tiles. At each corner of the two parallelograms, might be planted a tree, say, one apple, one pear, one plum, and one cherry, that is, eight in all; and at distances of about a yard, might be planted, all round, a foot from the paths, alternately, gooseberry-bushes, currant-trees, and raspberry-trees, and between them, various kinds of flowers, to come into blossom at different seasons. At one end, the south end if possible, should be erected a small arbour, with a couple of seats in it, and at the two opposite corners should be two small manure pits,—one for the reception of well-rotted manure, to be quickly used, and the other for the reception of all weeds, leaves, and rubbish, which will make manure, and which should be mixed up from time to time with the spade. These pits should be used alternately. As soon as one has its contents well rotted, it should be emptied from time to time on the land, while the other pit should be used to hold the fresh matter newly collected. By the time this is full, the other will be empty, and then that may be used as a *collector* and the other as a *decomposer*, and so on, alternately.

MANURE.

It is of no use whatever to think of getting things to grow without manure. This is the life and soul of all garden operations. Almost everything can be converted into manure. The grass from lawns, fallen leaves, weeds, and all vegetable matter, afford good light manure. Strong manures are prepared from horse, cow, sheep, and goat dung. The dung of fowls and rabbits is also most excellent; and where fowls or rabbits are kept, their dung should be preserved with great care, and put by itself into a rotting-pit, or into a tank, and kept wet. The juicy part can then be used as a liquid manure, and will be found of a highly fertilizing property, and the more solid may be spread over the land. The best time for putting manure on the land is in dry or frosty weather, and it should be dug in as soon as spread. It is a very unwise plan to spread manure on the land and let it lie, as in such cases, much of the strength of the manure is lost. Young gardeners should be very careful in preparing and collecting manure, and also when they are moving it from the pits to the ground, they should take care and not soil their paths.

GARDENING TOOLS.

It is quite necessary that a young gardener should have proper tools. He should have a small but strong *spade*, a small but strong *rake*, a digging *fork*, a *hoe*, a *trowel*, a good *pruning-knife*, a *box* for seeds, a little *wheelbarrow*, a *line*, and above all, a little gardener's *apron*, and a *straw hat* with a *broad brim*. Thus equipped, he may commence his gardening operations with great comfort to himself and some chance of success.

DIGGING.

The young gardener should practise digging, with a view to digging well. In beginning to dig a piece of ground, he should first clear it of all sticks, stalks, or stones, that might impede his labor. He should then commence at one end of the ground, with his back to the sun, if possible, and, beginning from the left-hand corner, dig one line all the way to the right-hand corner, either one or two spades deep, as may be required. The ground should be turned over, evenly laid up at the top, nice and level, and the weeds completely buried. The operator should dig carefully when near the roots of gooseberry, currant, raspberry, or fruit trees, and more carefully still, among flowers. If digging early in the season, he must mind he does not dig into his *bulbs*; such as lilies, tulips, snow-drops, crocuses, or daffodils, and cut them to pieces.

In the latter part of the year, in November and December, it is a good plan to dig up any unoccupied ground into ridges, and leave it in that state during the winter, that the frost may act upon it. The effect of frost upon the ground so prepared is very beneficial, as it breaks the clods and pulverizes the more cloggy portions, which fall down in a thaw as a fine soft mould. When manure is dug into the ground, it should not be dug in too deeply, about four or five inches being quite sufficient in most cases.

WEEDING.

Gardens will always produce a great deal more than is wished for, in the shape of

various herbs, shrubs, and plants, called weeds; such as dandelions, couch-grass, cow-parsley, chick-weed, and many other plants, which go by the general name of *weeds*. These, if left to their own natural growth, would soon cover the ground, and take away from the garden plants the nutriment in the soil designed for them, besides entangling their roots, stems, and leaves; therefore, weeding is as indispensable as digging. The young gardener should make up his mind before he sets foot in his garden to have *no weeds in it*; for however assiduous he may have been in other respects, however he may have planted, watered, dug, or attended to his garden, if it show a crop of weeds, he is a bad gardener, and will be sure to get laughed at. Weeds may either be pulled up by the hand or cut up by the hoe. In both cases, the roots must be eradicated. They must not be plucked from the stem, or cut from the level ground by the edge of the hoe, but hoed or plucked up, root and all; and after they are got up, they are not to be left about in the ridges to take root and grow again, but must be cleared away and safely put into the pit, never again to rise, but in the chemistry of good manure.

PLANTING AND SOWING.

Everything in a garden must be planted in some way or other, and there are many ways of planting and sowing. Sowing relates more particularly to seeds, and planting to the setting of plants that have been raised from seed in the first instance. The sowing of seeds is a very important work, and before seeds can be sown with a prospect of their springing up properly, the preparation of the soil, the time of the year, and even the time of day, must be taken into consideration. Some seeds perish in particular kinds of soil, while others thrive luxuriantly in them. Onions like a rich soil, as do cauliflowers and asparagus. Carrots and parsnips like a loose or sandy soil, as do sea-kale and many other plants. Some plants will only grow in bog earth; and some thrive, such as strawberries, best in a clayey loam. Attention to such matters must be given by the young gardener, if he wish to have his garden what it ought to be.

HOT-BEDS AND FRAMES.

Frame

Before we can sow many kinds of seeds in this country in the open ground, it is necessary to raise them first in a hot-bed, and for this reason,—many flowers common in our gardens are not natives of our cold and variable climate, but of one much warmer; and if we delay to sow the seed of such plants and flowers till the warm days of summer are fully set in, the plant has scarcely time to grow into perfection before the chills of autumn come on, and they perish before their blossoms, fruit, or seeds come to perfection. But this may be obviated by means of a frame and hot-bed, which every young gardener ought to have, however small it may be. One of the simplest is the common garden or cucumber frame, which may be bought for a few shillings. This, if about a yard square, should be set upon a low framework of bricks, within which a pit is dug, and filled with good manure over which some fine mould is placed, to the depth of about six inches. Upon this mould the more delicate kinds of flower-seeds may be sown at an early period of the year,—varieties of all those found in the gardening books under the head of tender annuals,—balsams, French marigolds, tobacco, stocks, marigolds, gourds, and sun-flowers. The seed must be sown carefully,—not too thick, and occasionally looked at. In mild, open weather, the glass should be raised a little, but in cold weather kept down. The giving of water should be managed with care, and the plants as they appear should not be suffered to grow too rapidly, but be kept under, or they will not bear to be transplanted when the time comes for doing so.

In transplanting, care should always be taken not to transplant too early, or in improper weather; for if the weather happens to be cold or wet, the tender plants will suffer very much, and probably fail. This would be the case, not only with flowers, but with all the tender kinds of plants, such as cauliflowers, and, therefore, the young gardener must keep his "weather eye" open, as the sailors say, and not be too much in a hurry, as young gardeners generally are.

OPEN CROPS.

In the sowing of open crops, care should also be taken to sow at the proper time. Very early sowing is generally hazardous, but yet, if you would have your crops come in soon, a little risk must be run. When seed is sown in the open ground, it requires watching, and this particularly applies to such crops as early potatoes or beans. Sometimes potatoes are sown in February, with the view to an early crop; and in April the young tender sprouts appear above the ground. One night's frost,

however, settles them,—down they go, black and jelly-like to the earth; but if the weather be doubtful, the thoughtful young gardener takes care to cover up the tender shoots with dry leaves or straw, to break the icy tooth of the frost, and save his crop. The same care should be also bestowed upon any other vegetable of a tender kind, and without this care, gardening would come to nothing.

After seeds are sown, they have many natural enemies. The slug, the snail, the wire-worm, the impudent sparrow, and the most impudent and insolent chaffinch, who all seem to have an idea that the seed is put into the ground entirely for their benefit. As soon as the pea-shoot comes above the earth, the slug has a mouthful in its tenderest moments; after the shoot has in part recovered from the gentle nibble, Master Sparrow swoops down and picks off, as quick as he can, all the delicate little sprouts by mouthfuls: to make a fit ending to what is so well begun, the chaffinch descends in the most impudent manner, close to your face, and pulls up stalk and pea both together, and flies away as unconcerned as can be. Now it is of no use to stand with a gun or a pair of clappers in your hand all the day after these intruders, and the only protection is by a net, or rows of twine strung with feathers, stretched over the bed in rows, and a few other pieces of white twine crosswise in their immediate vicinity. Birds do not like the look of any threads drawn across the ground, and they will rarely fly where there appears danger of entanglement; and this method is the best that can be adopted for seed-beds. A *Guy* is also good; and there are few boys who do not know how to construct one. A *Guy* is also particularly appropriate for the *early Warwick peas*. As to slugs and caterpillars, they must be hunted for and picked off; and if they abound in a garden, the line of shooting peas, beans, or other seed, must be dredged with a little slacked lime, which is an infallible mode of protection. But mind the lime does not blow into your eyes; for, if it does, you will be worse off than the caterpillars.

RAKING.

When seeds are sown, the beds should be nicely raked. Some seeds, such as carrot and parsnip seeds, should be beaten down with the flat part of the spade, and laid very evenly and nicely. The edges of the little cross-paths should be sharp and straight, and the whole put into a ship-shape order. The stones should be raked off into the cross-paths, and may remain there until the land is dug up in the autumn or winter, when they may be removed. There is a good deal to be

done with the rake in many ways, besides the raking of beds. It is a very useful tool to job over a bed when some kinds of seeds are sown: it also makes a very good drill, and is especially useful in getting leaves from the paths and borders; but it should be used with a light hand, and care taken not to scratch the ground into holes with it, as many young gardeners do.

HOEING.

Dibber **DIBBER.**

The hoe is of very great use, both to hoe up weeds and to form drills. We have spoken about its former use, and shall now say a word or two about the latter. In forming a drill for peas, beans, or other seed, one thing is above all things requisite, namely, that it should be *straight*. A drill resembling a dog's hinder leg, never looks well in a garden, and therefore the little gardener must have recourse to his *line*. This ought to be long enough to stretch quite across his ground, and when he wants to strike a drill, he should stretch it across from path to path, and, taking his hoe in his hand, cut or scrape a little furrow, about three or four inches deep, by the side of his line. In sowing peas and beans, the drills are generally a yard apart, and between them other crops are sometimes sown. Very often a crop of spring-spinach or of radishes is sown between lines of peas, and so on of other intermediate crops.

The line is very useful in all kinds of planting. In planting broad-beans, they are put into the ground by a *dibber*, which is a piece of wood with a pointed end and a handle. The holes are to be dibbed along the side of the line. The same tool is used in a similar way in planting potatoes, strawberries, cabbage-plants, and a variety of other roots, which require to be planted in straight and equidistant lines.

TRANSPLANTING.

There are a great many vegetables which require to be transplanted,—some from the hot-bed, and some from the open ground, where they have sprung from seeds, to their destination in the garden. All transplanting should be done with

care. Some plants, such as cabbage plants, do not require so much care as others, but every plant to do well should be well planted. Young gardeners are liable to many mistakes in transplanting; one is, that they often put the root of the plant into the ground bundled together; another is, that they make the hole too large with the dibber, and are not careful in pressing the mould to the root at the bottom of the hole, so that the root of the plant has nothing to feed upon. All this the thoughtful little gardener will avoid; and when he puts a plant into the ground, he will reflect that if it be not well *planted* it will *not grow*. The young plants of the more delicate flowers should be moved with the greatest care into spots congenial with their natures. Some plants require a warm, some a cool situation, some a moist, some a dry one, and these will be ascertained by studying the nature of the plant.

WATERING.

Boys generally fancy there is nothing like watering, and they are very pleased when they get the watering-pot in their hands. They always like to be watering, —no doubt thinking that the more the seeds and plants are watered the better they thrive; but this is a mistake, moderation in all things should be the motto. When a plant wants watering artificially, it in general shows its wants by very unequivocal signs, namely, by a drooping of its pretty head and leaves; and then, if too much water be given to it, it soon springs up with great luxuriance; and the first burning day of sunshine is likely to kill it, or to do it great injury. The rule should be, to water as little as possible, and to wait as long as possible for nature's heavenly rain, which is better than any artificial watering. Plants should never be watered during the middle of the day, but early in the morning, or when the sun is descending in the evening. Pump-water should never be used if rain or pond-water can be obtained. Much good often results to plants and seed-beds from the use of *liquid* manure. This can be easily prepared by getting an old beer-cask and knocking out the head. The bottom should then be fixed in a hole dug to receive it, and the earth allowed to reach to the brim. Some of the best manure to be had should then be put into this, with a pound or two of guano, and pour upon it three pails of water. It should then be allowed to stand for a week or two, and used as required. The effects will soon show themselves in the increased growth and vigour of the plants.

ON THE PROPAGATION OF VARIOUS KINDS OF SHRUBS AND PLANTS.

Besides sowing seed and rearing plants from them by transplanting, there are many other ways of propagating plants, namely, by *off-sets*, *suckers*, *layers*, *divided-roots*, *cuttings*, and *pipings*. If tulips and hyacinths be examined, it will be found, that besides shedding seed, the bulb of the plant very often makes a smaller bulb on the larger one, and this, if taken off and planted by itself, becomes a new plant: many plants may be propagated in this way. The strawberry also, will be found to send off a long shoot, and, at about a foot distant from the parent root, a little knob appears, having a bud to spring into the air and a root to work into the ground: this is called a *runner*. These may be cut away from the parent and planted separately, and will become a new plant. Many other plants, such as roses, raspberries, and lilacs, send from their roots little thin stems: these are called *suckers*, and may be removed from the parent shrub and planted by themselves, when they will become separate plants. Many plants can be propagated by what are termed *layers*. To do this, nothing more is necessary than to select a shoot, as near the root as possible, and having partially divided it with a knife, make an upward slit in it, and then placing a bit of twig between the divided parts, press it down to the ground, burying the joint beneath the surface of the soil. To plant from *cuttings*, some care is necessary as regards green-house plants, but nothing is easier than to rear fresh stocks of roses, currants and gooseberries from cuttings, as it is only necessary to cut the shoots cleanly off, and, after reducing them to about six inches in length, to place them in the ground with the shooting end upwards. They should be planted about six inches apart, and after the first year be removed to their proper situation; and they will bear fruit in the following year. To plant from *pipings*, such as pinks and carnations, it is only necessary to pull off one of the tubular stems, and dividing it at or near the joint, pull off the surrounding leaves, and insert the end or jointed part in some fine sand-mould, placing a glass over them till they have "struck," that is, formed roots, when they can afterwards be transplanted.

PRUNING.

Gooseberry Tree **GOOSEBERRY TREE.**

Currant Tree **CURRENT TREE.**

Little gardeners ought to know something of pruning trees. To cut or prune gooseberry and currant-trees is very simple. Gooseberry-trees should be cut differently from currant-trees. In gooseberry-trees, much of the fruit grows on wood of the last year's growth, but on currant-trees, the fruit is, for the most part, found near the knob or joint between the old wood and the new. To prune gooseberry trees, all the old dead wood should be cut out, and every branch that trails on the ground should be cut away, all branches in the centre of the tree that intersect each other, and all ugly branches, should be removed,—all suckers should be taken from the root, and the stem of the tree left straight and free to about ten or twelve inches from the ground, and the tree trained to throw its branches into the kind of form in the margin. The branches should then be cut, i. e., about half of the white or new wood should be cut *cleanly* off with a sharp knife, and the cuttings carefully gathered up.

In cutting currant-trees, nearly all the white wood should be cut away, leaving only head shoots to some one single or middle shoot of a main branch. The under-wood, old wood, and irregular and ugly wood, should also be cut away, as recommended at the cutting of gooseberries. In pruning or cutting raspberries, the old wood should be cut quite away, and the stems of the last year shortened about one third.

GRAFTING AND BUDDING.

Grafting is the transferring of a shoot of one tree into the stem of another, called the *stock*. Into this a slit is made; and then the scion or shoot is cut into the form of a tongue and inserted into it. The head of the stock is then cut off in a slanting direction, and the two are then tied together, or closely wrapped together, in moss, covered with grafting clay. No book can give directions so clear for grafting, as to enable the young gardener to perform it successfully. He must see it done, try it afterwards, and then ask if he has done it correctly; and to learn grafting and budding well, it is only necessary to get on the right side of the gardener. The same may be said as regards the pruning of vines, fruit and wall

trees. Ten minutes' experience with the gardener will teach more than twenty volumes on the subject.

SHIFTING OF CROPS.

Crops must not be grown twice in rotation on the same ground. Peas and beans should be the crop after any of the roots, such as potatoes, carrots, and parsnips. Cabbages, and plants of that kind, may be sown and grown intermediately. The best rotation of crops will be found in any gardening book on the subject, and this the young gardener should make a subject of some study.

HOW TO MANAGE A LITTLE GARDEN ALL THE YEAR ROUND.

JANUARY.

The chief wish of the little gardener this month is to take advantage of the hard frosts, and during their prevalence, to wheel upon his ground such manure as may be necessary. It should be wheeled in at this time, because, while the frost is hard, the wheelbarrow can pass over the paths and beds without doing much injury, nor will the dung and rubbish in its moving make more dirt than can be easily swept up. The manure should be left in heaps, and not spread till the time comes for digging it in.

In the middle or latter end of the month, should the weather be fine and open, attention should be given to the cutting of the gooseberry, currant, and raspberry-trees, and to the planting of off-sets from each, or of cuttings, as directed. A crop of peas might be sown, as well as mustard and cress, and a few broad-beans for coming in early. The peas and beans should be sown in rows, about a yard apart, and a little spinach might be sown in a broad drill, made by the hoe between them. The gravel-walks should be turned up in the first thaw and left in a ridge, ready for turning down and rolling when the weather becomes fine and dry.

Radishes may also now be sown in beds prepared by digging and freshly turned

up. The seed should be thrown in, not too thickly, and raked over. Straw should then be placed upon it to keep off the birds, or a Guy and feathers. The straw must be kept over the beds in the frosty weather and during the night, and taken off in the morning.

Now is the time to plant bulbous roots, such as snow-drops, crocuses, tulips, hyacinths, jonquils, daffodils, and flags; and off-sets of bulbous roots may be planted in beds. Anemones and ranunculuses may also be planted in dry weather, and some of the most hardy of the perennial and biennial shrubs, as asters, Canterbury-bells, and campanulas, may be planted.

FEBRUARY.

In February, the young gardener will find much to do. In the flower-garden, he may finish planting the remainder of the bulbous roots, such as the star of Bethlehem, fritillarias, narcissuses, and gladioluses, in beds or borders, all for flowering the same year. Some may be planted in pots to flower in the house, or they may be placed in the hot-bed for early flowering. Some of the hardy annual flower-seeds may now be sown.

In the kitchen-garden, if we may so call it, a little crop of turnips may be sown to come in early. Cabbage-plants may be set in rows; and a little lettuce-seed may be sown under the frame in the hot-bed. This frame should be well covered at night, and slightly raised in the day time, when the weather is mild, to give the plants within it light and air.

MARCH.

In the flower-garden, the gardener may begin to sow in beds, borders and pots, larkspurs, candy-tuft, lupines, sweet-peas, Venus's looking-glass, pansies, stocks, sweet-scabius, and many others.

In the culinary department, now is the time to sow a little bed of onions in a well-manured bed. A bed for carrots may also be prepared, and the seed sown and well trodden down. A bed of parsnips should also be prepared in the same way; and another crop of peas of the marrow-fat kind may be planted in drills in the same manner as the former. And now, perhaps, the cabbages will require the earth to be drawn to their stems; and, if the little gardener has room, he may

plant three or four rows of early potatoes. They should be the cuttings of large ones, with not more than two eyes in each piece, and should be planted with manure in rows, about two feet and a half apart and about a foot distant from each other.

APRIL.

Now is the time to begin sowing the more tender annual flower seeds. Some should be sown in the hot-bed; such as African and French marigolds, Indian pinks, China-asters, yellow-sultanas; and many others of the hardy kind, wall-flowers, Canterbury-bells, French honey-suckles, mignonette, pinks, and daises may be planted.

In the kitchen department, kidney-beans may be sown, and at the latter end of the month scarlet-runners and French-beans may be planted. It is not a bad plan to raise a few scarlet-runners in the hot-bed, and to plant them out when they have formed roots, and two or three leaves at the head. But as these kinds of beans are very tender, they should be carefully watched, and covered with straw on the sudden appearance of frost, which often takes place in this month.

MAY.

Now may be sown the tenderest of the annuals in the hot-beds, as cock's-combs, tricolors, balsams, egg-plants, ice-plants, and others of that kind. Dahlias may also be placed in the bed in this or the former month, and suffered to sprout, previous to planting in the open ground. Bulbous roots of every flower now out of bloom, and the leaves decayed, may be taken up and the off-sets separated dry, and housed for future planting.

Now is the time to plant melons, gourds, and pumpkins. The seeds of these should be sown in April in the hot-bed, and the plants should be transplanted into good ground in a warm spot, about the latter end of the month. They will grow freely and produce ripe fruit in August. Common pumpkins may be sown on one of the dunghills. The gourds, such as the orange-gourd, may be planted near an arbour, and be trained up the principal parts. French-beans and scarlet-runners may also be planted, if not done before; and should the young gardener have raised any tomatoes or capsicums in his hot-bed, now is the time to plant them out, as well as the slips of geraniums and tobacco-plants.

The young gardener will now find employment in sticking peas and beans, weeding and transplanting. And such broad-beans as are now in blossom, should have their tops nipped off, to promote the setting of the pods. But let him be very careful to look after the weeds, which now grow in great abundance; and let him rake nicely all his borders and keep everything clean and neat, as this is the most brilliant time of a garden's beauty.

JUNE.

Look well to the strawberries, and see that they are well watered, which operation should be performed in dry weather every other day. These plants will by this time have made their runners, and these should be cleared away, except those that may be required for making fresh beds, which may now be planted. Trim the roots a little, and cut off the strays or runners from each plant.

Look well at this period, morning and evening, for snails and other insects, and after showers of rain in particular. If there should be any small cherry trees or other fruit trees, they ought be netted or well watched, or the birds will eat them.

All sorts of flowers may now be planted out into the borders. Some may also be put in pots, such as balsams. Take care, however, that they are removed in damp or showery weather. In dry weather, take up tulips, crown-imperials, and jonquils, such as are past flowering, and pluck away the off-sets: let them be well cleaned and dried in the shade from the mid-day sun; then put each sort into separate bags or boxes, and keep them in some dry apartment till September, October or November, at which time they will have to be planted again. Most other bulbs may also be now taken up and put away for future planting. June is also the proper time to propagate pinks and carnations by pipings.

JULY.

This is the time to plant out savoys and cabbages for winter use. Brocoli may also be planted, and some seed sown for a late spring crop. The plants raised from this seed will be ready to put out, finally, in the middle and towards the latter end of August and the beginning of September, and will produce small heads in April and in the beginning of May. Lettuces may be now planted out, and other seed sown for future use. Spinach for winter may also be now sown; for this, that part of the garden should be chosen that has the most of the winter's

sun upon it. Now is the very best time in the whole year to sow the large black turnip-rooted radish for autumn and winter. The young gardener must at this period be on the watch for such seeds, both of flowers and garden vegetables, as are ripe. This should always be done in dry weather,—cutting or pulling up the stems with the seeds in. They should then be spread in an airy place where the sun and wind will dry them thoroughly.

The various herbs, such as balm, penny-royal, sweet-marjorum, sage, lavender, marigolds, should also be gathered up for winter use. Slips may now be planted from any of these. Take the side shoots of the branches four or five inches in length, and plant them in a shady border, and do not forget to give them water.

The ground should be kept clear at this period from refuse leaves, stumps of cabbages, haulm of peas and beans, and from all decaying rubbish and litter. Cut box-edgings also; and if the operation of budding is to be performed, now is the time to do it.

AUGUST.

Look over the flowers in borders from day to day, to see what they require. When the shoots of rambling flowers interpose with each other, they should be shortened, so that every plant may stand singly, as they always appear to best advantage when they stand clear of each other.

In this month, we must still continue to look out for ripe flower-seeds; also, there are several kinds of autumnal flower-bulbs, which may be planted, such as the autumnal crocus and Guernsey-lily.

Now weed and water seedlings, and shift such pot-flowers as require it into larger pots. In doing this, rub off the moulds and matted fibres from the roots, and throw away part of the outward, loose old earth. Then, having put a little fresh earth into the old pots, with a piece of broken tile over the hole in the bottom, put in your plant, and fill all the sides round with nice soft mould.

SEPTEMBER.

In the third or fourth week of this month, it will be proper to begin to plant the choice hyacinth and tulip roots for an early spring blossom. The bed should be dug at least one full spade deep, breaking the earth fine and laying the bed even

by raking, and then plant the bulbs about six inches apart. Ranunculus beds or borders may be prepared in the same way, and the plants planted similarly, about two inches deep. Take care of the new carnation and pink pipings or layers, and let them be transplanted as soon as convenient. Perennial plants, such as carnations, pinks, and sweet-williams, may now be transplanted. Now may be sown the seeds of bulbous flower roots, as tulips, crown-imperials, hyacinths, and most other bulbs. Evergreens may now be transplanted, and much work be done in the preparation of manure, and gathering in crops of various kinds.

OCTOBER.

This month again ushers in planting in various ways. In the kitchen department, beans may be planted for an early crop in the succeeding spring; that is, if the frost does not nip them. A warm border, under a south wall is the best place for them. A few peas may be sown also, to try the chance of the winter. Sow lettuce and small salad and radishes; also transplant lettuces to situations to stand till the spring. A few rows of cabbages for the winter and spring should now be planted, and winter spinach sown. Now is a good time to begin to dig up parsnips and carrots to store away for winter; and now all ground not in use should be well dug up and trenched, to lie ready for the winter's frost to act upon it. Now gather various fruits as they are fully ripe, and choose dry days for so doing.

NOVEMBER.

The season is now closing, yet a good deal is to be done by those who love a garden,—a vast deal of planting and transplanting of every variety of flowers. Roots of many may be separated, and fresh sorts planted. Nearly every kind of bulbous roots, if not previously planted, may now be put in the earth. The cuttings of gooseberry and currant trees may also be planted, and young trees raised in the spring be transplanted to their proper situation. It is also a good time to plant filberts, hazel-nuts, and barberries. Strawberry plants should have a dressing of good manure.

DECEMBER.

Make neat the borders, dig all loose ground, turn the manure, plant suckers from old roots, roll green and gravel walks, gather seeds on fine days, cut away old wood, nail fruit trees, prepare hot-beds, get matting to put over tender plants

during the frost, look over seeds, and see that they are dry and properly put away and make all clean, nice, and neat for the coming spring.

Such is an outline of what a boy may be expected to do with his little garden. A great deal more is to be learned than can be learned from a book; but if the young gardener will keep his eyes open, reflect on the reasons for doing things, and pay attention to the voice of experience, he will probably reap more real delight from his few yards of ground than from all the toys and playthings he ever possessed.

PART VIII.

CARPENTERING.

Carpentering

There is not a more useful and pleasant amusement than that of "Carpentering." Every boy should be able to do little jobs with the plane and chisel; for whether he may turn out a gentleman or a poor man, it will be of great use to him. If a gentleman, he can amuse himself with it, and if a poor man, it will be of essential service to be able to put up a row of palings in his garden, to make a gate, to build a pig-stye, to make and fix up shelves, build out-houses, and perform sundry odd jobs about the house for his comfort and convenience.

Every boy should have a box of tools, and a bench to work at, also a little room or loft for a workshop. He ought to obtain good tools, and by no means buy the boxes of rubbish sold to boys for their amusement. He should go the ironmonger's and purchase the following tools; of course, out of his own savings,—his own pocket-money,—and not apply to his parents for it.

- Two saws, one small and one hand-saw.
- Four gimlets of different sizes.
- One pair of pincers.
- One pair of plyers.
- Four chisels of different sizes.
- One gouge.
- Two hammers, large and small.
- One mallet.
- Two bradawls.
- Two planes, long and short.
- Two files, large and small.
- One level.
- One square.
- One screw-driver.
- Nails, screws, rings, glue-pot, hone, oil, etc.

He must also manage to obtain a carpenter's-bench, which he cannot very well do without, and then he may begin carpentering with expedition.

USES OF THE VARIOUS TOOLS.

THE SAW.—Before a saw can be used after it is purchased, it generally has to be "set," as it is termed; that is, its teeth are to be sharpened and placed a little outwards from the plane of its length. There are several kinds of saws, namely, the common hand-saw, the key-hole saw, and the small-toothed saw. The first is to cut planks and thick pieces of wood; the second is to cut holes in planks or boards; the third is to cut small pieces of wood, or those that require to be very nicely divided.

THE PLANE.—The plane is used to smooth boards with. There are several kinds of planes. The long plane and the short plane are the principal ones. Within the plane is the knife, which is fastened in by a knock of the hammer on the wedge inside, which is made so as to fix the edged knife at any distance from the bottom of the plane, either for thin or thick shaving. A very little direction from the carpenter will enable the young carpenter to fix his knife properly; and a knock on the end of the plane with a hammer will loosen it in a moment. The knife should be sharpened from time to time on the stone or hone. This should be done with great care, so as to preserve a proper angle at the edge and great evenness in every part, otherwise, the planing will be very imperfect.

In planing, the wood to be planed is either laid flat on the bench, with its end against the little pin, to prevent its moving, or fixed in the screw of the bench, and the plane being brought upon the top or edge of the wood, is pushed carefully, but somewhat sharply along. The shaving comes through the hole in the plane, and must be cleared away, from time to time, out of the way of the knife. Everything planed should be planed perfectly level, smooth, and even.

Mortice And Tenon

THE CHISEL.—The use of the chisel is to cut square or sharp-cornered holes in wood, especially mortices. A *mortice* is the hole cut in a post or other piece of wood, in which another piece of wood cut to fit it, called a *tenon*, is put. The tenon and mortice should both be cut exactly, and so that they fit at right angles, firmly and securely. Tenons and mortices are of perpetual use in carpentering, and the young carpenter should learn as quickly as possible to make them.

THE MALLET is to be used instead of the hammer for a variety of purposes. In cutting mortices, it is the mallet and not the hammer that is used, and in almost

all cases where the chisel is employed, the mallet should be used. Were we to use a hammer to knock the end of the chisel, we should soon split its handle, or so bruise it, as to make it unservicable.

THE GIMLET AND BRADAWL.—The gimlet is used to bore awls with, so that nails when they are driven in may not split the wood. Bradawls are used for the same purpose, before smaller nails, called *brads*, are put in. A bradawl is sometimes called a nail-piercer. There is a thread gimlet now come into use, but this requires much care in handling: it must be very gently put in, and very gently taken out, or it will snap like a piece of glass; but it is a very useful tool, and is a great improvement upon the old gimlet.

PINCERS AND PLYERS.—Pincers are used to take loose nails out of wood, to wrench off staples, or other things that have been attached to wood. Plyers are a smaller kind of pincers, and are used for small work in the same way. They are very useful tools, and it is impossible to do without them.

Hammer

THE HAMMER.—Almost everybody knows how a hammer is used: it is used to drive nails with, and also to take them out. The hammer used to take out nails, is called a claw-hammer, from its having a claw at one part. The claw is placed under the head of the nail, when the handle of the hammer becomes a lever, and the head the fulcrum; and, placed in this position, the hand acquires great power, —sometimes amounting to at least a hundred-weight. In using a hammer, we should always be careful to use the kind of hammer necessary for the work to be done.

FILES.—Files are of various uses, and we cannot do very well without them in carpentering. There are several kinds of files: one kind flat on one side and rounded at the other; another is flat on both sides, and another kind has three edges and three flat sides. The first is used for rasping wood or other things down to a level; and the others are used to file things into a point, or to cut them in pieces.

THE SCREW-DRIVER is used to drive in and take out screws. It ought to have a very hard tough edge and a long handle. When placed in the head of the screw, to drive in, it should be turned from left to right, and in taking out, from right to left. There is a particular way of getting out a screw, which is only to be learned

by a little practice. The knack consists in combining with nicety the pressure on the screw-head and the turning of the driver. The young carpenter will now and then find a very stubborn screw and fancy it quite impossible to get it out; but by a little perseverance, he soon finds out the knack of doing it; and what seemed immoveable yields to his skill and strength. There is one thing young carpenters frequently do, and that is, to use their chisels for screw-drivers; the consequence of this is, the spoiling of the chisel, for the edges are sure to break away.

Level

THE LEVEL.—Every piece of work should be square and level, except when it is of a curved form, and then it should be reduced to the principles of the circle or ellipse. The level is used in putting up posts, palings, or work of any kind in an upright position. It consists of a hoard of wood, upon which a string is suspended, having a plummet at the end of it, which falls along a straight line at a right angle with the bottom of the level. To obtain a perfect perpendicular and perfect horizontal, the level is placed on the work till the line falls exactly over the nick at the top of the hole. The square is principally applied to things made at the bench, and is used to bring everything made to a *right angle*, so that a true level and perpendicular is thus secured.

STUFF.

The young carpenter will find it very difficult to work without stuff. He ought, therefore, to purchase a deal sawed into planks or boards, consisting of one three quarters of an inch thick, another one inch thick, and another half an inch thick. He ought, also, to obtain a slab not sawed at all, to cut out as occasion may require. He will then be provided with wood. He must also lay in a stock of various kinds of nails, screws, rings, hasps, hinges, etc., and, above all, a good substantial box to keep his tools and other matters in. This should be divided into compartments, and everything should be arranged in it with neatness and order.

LABOUR.

The young carpenter ought to be fond of work; and to feel a pleasure in it.

Should this be the case, there is scarcely an end to his labours. He may make his hen-houses, his rabbit-hutches, his summer-houses, his boxes, seats, rustic-chairs, lattice-work and palings for his garden, build out-houses, and make book-shelves; in short, amuse himself with the manufacture of a great variety of things, both for use and ornament, and of which he may justly be a little proud.

Such an amusement is infinitely superior to feats of conjuring and legerdemain, tricks with cards, and impositions of various kinds, which are put in some books for the amusement of young people, and which are highly pernicious both to their mental and moral progress.

PART IX.

KEEPING POULTRY.

Keeping poultry is an innocent amusement both for boys and girls. Domesticated animals, unlike the free inhabitants of the country, do not suffer from the loss of liberty, and when they are well housed, fed, and attended to, they are as happy in their state of domestication as they would be in their wild state of liberty; perhaps, more so, and therefore it is quite right to keep them.

There is something very pleasant in watching the old hen as she sits so patiently on her nest, and to see the little birds issue from the eggs, with the proud but careful mother strutting by them, and scratching and toiling to obtain them food; and nothing is more touching to a sensitive mind than to behold her at the least chill of air, or overcasting of the clouds, calling her young brood under her wings for warmth, shelter, and security. There are many lessons of good to be learned in fowl-keeping.

In proceeding to keep poultry, the young poultry-keeper should first secure a proper place to keep them in. He ought to be able to build, if not the whole, a great portion of his poultry-house, which need not be on a very extensive plan; but there are a certain number of little requisites belonging to it which ought not to be forgotten.

Keeping Poultry

NATURE AND SITUATION OF FOWL-HOUSE.

Side View SIDE VIEW.

The situation of a fowl-house should be such as to afford sun and warmth in winter and spring, and shade in summer. It should be well covered in at the top, free from damp, have good ventilation and light, with windows of lattice-work, with boards behind to open and shut. It should be placed against a wall with a slanting roof. The side should contain one latticed window (A); the front, also, a latticed window (B), with a hatch-door, partly latticed and partly boarded at the

side. A little door for the fowls should communicate with a fowl-yard, as seen below.

Front View
FRONT VIEW.

Fowl Yard

The above is a sketch of the ground-plan of the house and fowl-yard. H is the fowl house. No. 1 is a small pit filled with dry sand and ashes, in which the fowls may roll to free themselves from vermin. No. 2 is another small trench or pit, containing horse-dung and rubbish of various kinds, to be frequently renewed, in which they may amuse themselves in scraping for corn and worms. No. 3 is a square of turf, on which they may pasture and amuse themselves. Two or three trees ought to be planted in the middle of the run, and these might be cherry or mulberry trees, as they are very fond of the fruit. Nos. 4 & 5 are two little stone tanks for water, and No. 6 is a pond for the ducks, in case it should be thought advisable to keep such, which I should strongly recommend to be done.

Within the fowl-house there must be perches put up for the fowls to roost on. These should be placed one above another at the corner, and so disposed, that one range of birds does not sit quite under the other, for reasons which need not be explained. At the bottom of the fowl-house, but not under the perches, should be placed the nest boxes, from four to six, as may be required, in which straw should be placed for the hens to make their nests with. The fowl-house and everything about it should be kept scrupulously clean, and be frequently white-washed; and it is good, occasionally, to fumigate the house by burning herbs, and juniper and cedar woods.

THE VARIOUS BREEDS OF FOWLS.

These are very numerous, and are becoming more so every day. Among them are the following:—

THE DORKING BREED.

So named from the town of Dorking in Surrey. It is one of the largest of our fowls. It is of an entire white colour, and has five claws upon each foot, *generally*, for some have not. They are good layers, and their flesh is plump. They make excellent capons.

POLAND BREED.

The Poland fowls are greatly esteemed, but they are seldom to be met with pure in this country. They were originally imported from Holland. Their colour is shining black, with white tufts on the head of both cock and hen, springing from a fleshy protuberance or "King David's crown," the celestial in heraldry. This breed lay a great quantity of eggs, and are sometimes called "everlasting layers." They quickly fatten, and are good eating.

SPANISH BREED.

The Spanish fowl, with the Hamburg and Chittagong, is a very large fowl, laying large eggs, and all seem more or less allied to the Polish family. They are well adapted for capons, and produce eggs nearly equal in size to those of the Malay hens. This breed is now common, particularly in London.

BANTAMS.

This breed is small, but very beautiful. It came originally from India. They are frequently feathered to the toes; but booted legs are not exclusively peculiar to Bantams, for Bantam fanciers, with Sir John Sebright at their head, prefer those which have clean bright legs without any feathers. The full-bred Bantam-cock should not weigh more than a pound. He should have a rose comb, a well-feathered tail, and a proud lively carriage. The Nankeen coloured and the black are the greatest favourites. The Nankeen bird should have his feathers edged with black, his wings bordered with purple, his tail-feathers black, his hackles slightly studded with purple, and his breast black, with white edges to the feathers. The hen should be small, clean-legged, and match in plumage with the cock. For young persons, Bantams are the best kinds of fowls to be kept, as they make but little dirt, and are very gentle and pretty.

CHOICE OF STOCK.

In commencing fowl-keeping, it is important to choose young and healthy sorts. There should be a two year old cock, and pullets in their first year. In choosing them, we should note that the comb is red and healthy, the eyes bright and dry, and the nostrils free from any moisture. The indications of old age or sickness are paleness of the comb and gills, dulness of colour, a sort of stiffness in the down and feathers, increased length of talons, loose and prominent scales on the legs.

There should be from four to six hens to one cock, the latter being the extreme number; and the conduct of the cock towards the hens should be watched, for if he should be of a sulky, selfish, persecuting and domineering disposition, the hens will be unhappy, and he ought to have his neck wrung, as a just reward for selfishness and tyranny.

FOOD AND FEEDING.

Fowls must be well fed, but they should not have too much. Over-feeding is as bad for fowls as for men. They ought not to be fed with stale or bad corn, but of the best, and now and then with a little buck-wheat; with cabbage, mangold-wurzel leaves, and parsley, which should be chopped fine. Where they are likely to be stinted for insect food, small pieces of meat chopped up should occasionally be added to their food.

On the floor of the fowl-house, a little sand should be occasionally spread, and sandy gravel should be placed in the corners. The small sharp stones found in gravel are absolutely necessary to fowls, as they are picked up by the birds and find their way into the gizzard, where they perform the part of mill-stones in grinding the corn.

LAYING.

The early period of spring, and after a cessation at the end of summer, are the two periods at which fowls begin to lay. When the period of laying approaches,

it is known by the redness of the comb in the hen, the brightness of her eyes, and her frequent clucking. She appears restless, and scratches and arranges the straw in her laying place, and at last begins to lay. She generally prefers to lay in a nest where there is one or more eggs; hence it is of use to put a chalk egg into the nest you wish her to settle on.

The eggs ought to be taken from the nest every afternoon, when no more are expected to be laid, for if left in the nest, the heat of the hens when laying each day will tend to corrupt them. Some hens will lay only one egg in three days, some every other day, and some every day.

To promote laying, good food in moderate quantities should be given to the hens, and also clean water. A hen well fed and attended to, will produce upwards of one hundred and fifty eggs in a year, besides two broods of chickens. Some half-bred game hens begin to lay as soon as their chickens are three weeks old.

PRESERVATION OF EGGS.

To preserve eggs fresh for a length of time, it is only necessary to rub each egg with a small piece of butter, which need not be larger than a pea, or the tip of the finger may be dipped in a saucer of oil and passed over the shell in the same way. Eggs may be thus preserved for nine months.

HATCHING CHICKENS.

The eggs given to the hen to hatch must be perfectly fresh; they should be large in size, the produce of the most beautiful birds, well shaped, and the number put under the hen should vary according to her size, and may be from nine to thirteen eggs; odd numbers, old housewives say, are the *luckiest*.

When a hen wants to sit, she makes a particular kind of clucking, and goes to her nest. Here she fixes herself for a period of three weeks, at the end of which time, the young chickens break the eggs and come out perfect beings. They run about as soon almost as they are out of the egg, and in twenty-four hours will take food.

On the first day of their birth, chickens require nothing but warmth, and they must be kept under the mother in the nest. The next day, they may be put under a coop and fed with crumbs of bread soaked in milk, a few chicken's groats being added, and the yolks of eggs boiled hard. After being kept warm under the coop with the mother for five or six days, they may then be turned a little in the sun, towards the middle of the day, and fed with boiled barley mixed with curds, and a few pot-herbs chopped up. At the end of a fortnight, they may be left entirely to the care of the mother, who will be sure to perform her duty.

Such are the principal particulars regarding the keeping of fowls. There are many books written on the subject: one of the best of them is called the "Poultry-yard," which may be consulted for further information.

Tailpiece

PART X.

BEEES.

Bees

Any humane person must be unwilling to keep what may be termed "pets," when, as is very often the case, they are taken from the freedom which nature has given them, to be pent up in cages, hutches, and round-about boxes. It is not a part of good moral training to encourage children to deprive anything of liberty, and the keeping of rabbits, guinea-pigs, birds, gold and silver fish, white mice, pigeons and squirrels, is not only attended with a vast deal of trouble and expense, but with a great many bad smells, filth, and dirt. Such matters, have, therefore, been excluded from this volume, as being by no means calculated to improve either the minds or morals of young persons, but rather to have a contrary tendency.

These objections do not, however, lie against the keeping of *bees*, which afford at all times lessons of industry, of order, of contrivance, of perseverance, and of many other virtues, which are great ornaments to little boys and girls, as well as to grown men and women. We shall, therefore, give as copious an account of this interesting insect as we can, and, at the same time, show the best methods of managing it with advantage to its possessor.

Bee is the English name for an extensive *genera* of insects,—*apis* or the section *anthophla* or *mellifera* of modern classification. The common domestic bee, of which it is now our business to treat, is the *apis mellifica* of Linnæus; and it may be as well to state, for the guidance of the young reader, that the Hive-bee is distinguished from all other species of bees,—by having the shanks of the hind legs furnished with a smooth and concave pollen-plate on the outer surface, and destitute of spines at the extremity,—by the basal joint of the *torsi* in the working bees, of an oblong form, with its inner surface clothed with fine hairs, disposed in transverse layers,—by the oblong shape of its body,—and by the feelers at the sheath of the tongue being almost obsolete and formed of a single point.

The Hive-bee may be regarded as one of the most perfectly social species of insects, and one whose economy is regulated by the possession of a more remarkable degree of instinct than is perhaps possessed by any other insect. Another peculiarity regarding bees is, that there are not simply males and

females among them, but mules or workers, or female non-breeders, as they have been termed, which constitute the great mass of the population of a hive. They are smaller, as regards size, than the males or the female bees, and it is to them that the internal economy of the hive is committed, and upon them the whole labour of the community devolves. Moreover, it is their duty to guard and protect the hive and the queen, to feed the young, and to kill the drones at the appointed time.

In a single hive there are sometimes not fewer than thirty thousand of these individuals. They are distinguished from the breeding females by having a longer lip, the jaws not notched at the tip, and the sting straight. The male bees, of which there are several hundreds, sometimes even two thousand in a full hive, are idle creatures, doing no work. They are generally termed *drones*, and they are of a more bulky size than the other bees, and they are not armed with a sting.

Such are the inhabitants of the hive; the chief products of which are bees-wax and honey. The former is secreted by the worker-bees, by a peculiar apparatus on the under side of the belly, as occasion requires, and is employed for constructing the combs in which the family provision and the young brood are deposited.

Honey is obtained by bees from the *nectaries* of flowers, which, it is well known, are constantly secreting a sweet thick fluid. This is sucked up by the tongue of the insect, and a portion of it is consumed at once for its support, but the greater part of the supply, although taken into the stomach of the bee, is again brought up (regurgitated, to use a hard word), and poured into the cells of the hives for the food of the grubs and the use of the community through the winter.

Queen Bee **QUEEN BEE.**

Drone **DRONE.**

The cells into which the honey is poured for store are placed in the most inaccessible parts of the hive, and are fitted with waxen lids, but the honey destined for the use of the *nurses*, *workers*, and *drones*, is deposited in unclosed cells. In each honey-cell there is a cream-like layer or covering of a thicker consistency than the honey itself. This layer is perforated by the bee with its fore-legs, and is closed before the bee flies away.

Having thus noticed the inhabitants of the hive, we will now turn our attention to

the hive itself. The most profound philosopher, as well as the most incurious observer, is struck with astonishment on inspecting the interior of a bee-hive. He beholds a city in miniature. He sees this city divided into regular streets; and these streets composed of houses constructed on the most exact geometrical principles and the most symmetrical plan; some serving as store-houses for food, others for the habitations of the citizens, and a few, much more extensive than the rest, destined for the palace of their sovereign. He perceives that the substance of which the city is built, is one which man with all his skill is unable to fabricate, and that the edifices in which it is employed are such as the most expert architect would find himself incompetent to erect.

The nest, as constructed by the insects, consists of a continued series of combs, arranged vertically, each of which consists of a vast number of cells, forming two ranges backed against each other, and, consequently, placed in a horizontal position. A sufficient space is left between each of these double layers of cells to allow a couple of bees, engaged upon the opposite cells, to work without incommoding each other. In addition to these spaces, the combs are perforated in various places, so as to allow the bees a passage from one street to another, thus saving them much time. But it is in the construction of the cells themselves that the most admirable instinct is displayed. Geometricians are aware, that in order to occupy a given space with solid objects of equal size and similar form, without any useless interstices, three figures only can be adopted, namely, the equilateral triangle Triangle , the square or cube Square , and the regular hexagon Hexagon . Of these three geometrical figures, the hexagon most completely unites.

It is a remarkable circumstance, that in a new colony the design of every comb is sketched out, and the first rudiments laid, by a single bee, which having disengaged itself from the swarm, commences the building of cells, which is then taken up by the other wax-makers, and, subsequently, by the nurse bees, which give the finishing stroke to the cells; and so quick are the bees at their work, that a comb, twenty-seven inches long, by seven or eight inches wide, is built in four and twenty hours, and in five or six days they will fill the hive. The combs are attached to the roof and sides of the dwelling,—the hives or boxes to the floors and roofs.

There are three sorts of cells: the first one for the larvæ of workers, and for containing the honey,—these are of the ordinary form; the second are for the grubs of the males or drones, being considerably larger and more substantial,—

they usually appear near the bottom of the combs; the third are the cells for the females, of which there are usually three or four, and these are generally attached to the ceiling part of the comb, having very little wax in their composition. One of these cells considerably exceeds in height the ordinary ones, and they are not interwoven with them, but suspended perpendicularly, their sizes being nearly parallel to the mouths of the common cells, several of which are sacrificed to support them. After the queen bee has quitted her cell, it is destroyed by the workers, and its place occupied by a range of common cells. The queen bee deposits her eggs separately at the bottom of each cell: the egg is of a lengthened oval shape, with a slight curve, and of a bluish colour. The worker's eggs, which are the only ones laid by the queen during the first eleven months, hatch in a few days, and become little white maggots. Each is now fed with bee bread by the workers, very assiduously, and, at the expiration of six days, having attained its full size, it is roofed in by the workers, spins a silken cocoon, which occupies it for thirty-six hours, and then becomes a nymph or pupa, and, eleven days after this, quits its case, eats through the roof of the cell, and comes forth a perfect working bee.

For nearly twelve months, the queen bee deposits only workers' eggs; after which period, however, she commences laying those of drones. As soon as this change takes place, the workers begin to construct the royal cells, in which, without discontinuing to lay male eggs, she deposits now and then, about once in three days, an egg destined to produce a future queen. The food of the royal grubs has been termed "royal jelly." It is a pungent food prepared by the workers for the express purpose of feeding the grubs that are to be future queens, and is more stimulating than the food given to the common grubs.

Should it happen, as is sometimes the case, that the queen bee be killed, or the hive in any manner be deprived during the first eleven months of her existence, and before she has deposited any royal eggs, the most extraordinary circumstances occur. After a little while, a hubbub commences, work is abandoned, the whole hive is in an uproar, every bee traverses the hive at random, with the most evident want of purpose. This state of confusion sometimes continues for several days, then the bees gather in knots and clusters of a dozen or so, as though engaged in consultation; shortly after which, a resolution appears to have been taken by the whole population. Some of the workers select one of the worker-eggs, which had been previously deposited by the lost sovereign. Three cells are thrown into one for its reception,—the eggs in the two other cells being destroyed. The grub when hatched is fed with the royal

jelly, and a queen is produced. Even if the grub had been hatched and partly fed as a worker, and had only received two or three days' allowance of the royal food, the result would be the same,—they emerge from the pupa perfect queens whereas, had they remained in the cells which they originally inhabited, they would have turned out workers.

We now come to that period of the year when the queen insects, having undergone the change to the pupa state, are nearly ready to burst into life. It is now that the old queen mother, losing all her parental feelings, becomes infuriated: she rushes to the cells wherein are deposited the future queens, and instantly begins to tear them open. The guards which surround the cells make way for her approach, and suffer her to act as she pleases, whereupon she slaughters the inmates with her sting, without remorse, and, after a short time, a great portion of the working bees accompanying her, rushes out of the hive, and seeks another dwelling. This is called "swarming."

Something very like concerted action and foresight seems to belong to these proceedings. It is always in calm weather, when the sky is serene, between nine in the morning and four in the afternoon, when they quit their habitation. After flying about for some time in a cluster, by degrees they fix themselves on a branch, form a group there by hooking themselves one to another with their feet, and remain perfectly tranquil. Then it is that the proprietor may secure them, and form a new colony.

In this manner several swarmings take place in the course of the summer between the months of April and August. A good stock of bees usually produces three swarms in a favourable season: each swarm containing not only the young bees recently hatched, but also a portion of the old inhabitants. The duration of life of the different individuals is various: the male bees only live a few months, the workers only one or two years, and the queen only four or five. Such is, in brief, the birth, parentage, education, life, character, and behaviour of the honey-bee, and it will be only necessary now to say a few words regarding the management of these insects, with a view to instruction, amusement, and profit.

HOW TO GET A STOCK OF BEES.

They must be purchased, and the purchaser must take care and procure them of

some one upon whom he may depend. This will save a great deal of trouble. The hive should be weighed before and after a swarm is placed in it, and a note kept of its weight, a judgment may then be formed of the quantity of honey it contains in the autumn.

The hives should be sheltered by a wall, a hedge, or a tuft of trees, in order that the bees may get to the door of the hives with ease. This they cannot do if there are gusts of air sweeping round it, in which case, numbers of them will fall to the ground about the hive, from which, perhaps, they will not be able to rise before the chill and damp of the evening comes on and destroys them.

There must be water near the hives, as the working bees drink a great deal in the spring, and they are very fond of walking along straws which float in the water and sipping as much as they want. The door of the hive should look towards the forenoon sun, and the hive should not be raised above eighteen inches from the ground.

We will now suppose that your bees have laid up their winter store, and that you wish to share it with them. We say share it, because we do not suppose you are so cruel and foolish as to wish to kill your bees. You might as well kill a cow for the purpose of getting milk. The more bees you have, the more honey,—that is certain.

About the latter end of September, the flowering season is over, and few flowers remain for the bees to get honey from. This is the best time to ascertain what honey they can spare; therefore, weigh every hive, and deduct from it the weight of the hive and the bees, as ascertained when the swarm entered it at first, as above directed.

To live through the winter, a hive must have at least sixteen pounds of honey, and if you wish it to swarm early, it ought to have twenty-five or even thirty pounds.

When you determine on taking away the honey from a hive, either for your own use or for distributing it to other hives, proceed as follows:—

The first fine calm morning after the honey season is over, go to your hive provided with a tobacco-pipe in your mouth, a large dish for the honey in one hand, and a long knife with the point bent, and a goose or turkey feather in your other. Blow two or three full puffs of smoke in at the door, then turn the hive

upside down on the ground, so as to stand steadily, and immediately give the bees, who will collect on the edge of the comb to see what is going on, a little more smoke. This will stupify them so completely, that not above one or two will be able to fly out, and they will be so sick, that they will not dream of stinging you. Begin at one side of the hive, and cut out a comb, having first sent down a puff of smoke to make the bees go away to the middle and the other side. Proceed thus,—sweeping the bees off every comb back into the hive with the feather, till you come to the centre comb. The only nicety consists in blowing away the bees to prevent any of them being crushed. If the operation be neatly done, scarcely any bees will be killed. Take the hive now and replace it on its stand as before.

The next thing to be done is to join the bees, from which the honey has been so taken, to another hive in which you wish them to be accommodated, which may be done as follows:—In the evening, if you look into the hive which has been deprived of its honey, you will find all the bees hanging in the centre, just like a new swarm. Bring the hive near the one to which they are to be joined,—get about a table spoonful of raw honey or syrup, so thin as to pour easily, and have it in a jug beside the hive which is to receive the strangers,—blow a few whiffs of tobacco smoke in the door of the hive, then turn it up and give them an additional puff or two, and pour the honey or syrup from the jug all over the bees between the combs, so that they may be quite smeared over. Then spread a clean linen cloth on the ground in front of the hive, with one edge of it placed on the floor of the hive and secured there by two stones, to prevent its falling, and which will also serve to keep the hive a little raised from its floor on that side; now replace the hive so that the edge of the cloth may be under it while the two stones keep it raised about an inch; next take the hive containing the bees, hold it steadily over the cloth, and by one sudden blow, knock out all the bees upon the cloth in a lump. They will immediately begin to climb up and enter the new hive. If they were to be united without previously smearing one of them with honey or syrup, the chance is, that half of both hives would be killed by fighting.

Hives may be either of straw or wood. Bees thrive equally well in either. In winter the hives should be placed in a northern exposure, or, at any rate, the sun should not be allowed to shine too much on them, as it entices the bees out, who often perish by sudden cold.

You ought to keep at least three hives: Nos. 1, 2 & 3. No. 1 is the first or old one, say, of last year; Nos. 2 & 3 of this year's swarming, and these must be so

managed as to supply you with honey and the bees with food. This is well explained in a little book called the "Farmer," which those who wish to keep bees ought to study.

Such are the most important facts regarding the bee and its management. There are many little works on the subject to be obtained, but the few directions in the work above named will be ample information for the young bee-breeder, and ensuring him lots of honey, lots of lessons of economy, and lots of amusement.

THE END.

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