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CURLING:

THE ART OF THE GAME

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BY

JOSH BOWIE.

EDINBURGH:

JOHN ANDERSON, PRINTER, RAMSAY LANE, CASTLEHILL.

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I Dedicate

THIS WORK

TO MY FRIEND

Colonel Forrest

OF HAREMYRES.

CONTENTS.

CURLING.

THE THEORY OF THE GAME.

THE game of curling differs from every other which is pursued in our climate in the all-important respect that, even in the best of seasons, from the curler's point of view, the time at the command of the player in which to practise the game is very limited. In our variable and uncertain climate an average of four weeks for the last five seasons will not be under-estimating the time which even the most enthusiastic player has been able to devote to the game. This to the experienced curler may not mean any deterioration in play, for once a certain degree of proficiency has been attained in the art of playing the game, a day or two is, in most cases, sufficient to ensure the pliability of those muscles which a long period of enforced inaction may have stiffened. And then, too, the conditions are the same for all! Most players of the game manage, "by hook or by crook," to get to the ice at the earliest moment at which the game is playable, for ice, like time and tide, waits for none. But the acquiring of the rudiments of any art is usually tedious to the tyro, and how much more must this be the case where he can neither find nor make opportunities for practising this particular game, but must wait until these are afforded to him by conditions over which he has no control. To such the fleeting and uncertain opportunities afforded for practice by our uncertain climate must be discouraging—the greater reason, then, why he should go upon the ice with a good knowledge of the theoretical part of the game.

The old adage that "an ounce of fact is worth a ton of theory" must, like all proverbial sayings, be read *cum grano salis.* That more can be learned from a player in an hour than from the best treatise ever written on any particular game may be true, but, except where the player is also a competent instructor, it does not necessarily follow that what is acquired from such a source will be advantageous to the novice, and such instruction may be positively harmful. The beginner in the "roarin' game," moreover, is not always so fortunately situated that he can command the services of an expert player. In this game, "professionalism," with its degenerating influence upon the spirit of all games wherein it arises, has not made, nor is it ever likely to make, its appearance, and therefore the services of those expert in the game must be given *con amore.* The novice cannot, as in the game of golf, for a certain fixed fee command the instruction of one who can almost invariably play well, and perchance may have earned a great reputation at the game, but must try the good nature of some expert friend by asking him to devote time which he can ill spare towards the instruction of others in a game in which he himself was without rudimentary instruction. Moreover, the most competent teacher in any art is seldom he who is most proficient at it, and however valuable such instruction may be, when the player's knowledge of the game is such as will enable him to discriminate between what is good and what is bad in the application of such advice to his own case, the wisdom of following such a course at the outset of his curling career is open to grave objection.

If, on the other hand, the beginner proceeds to teach himself from observation of some good player's style, he is almost certain, in the absence of sufficient knowledge of the game, to be led into error. Every player, however expert he may be, has certain distinctive characteristics in his style of play peculiar to himself. These, from their very nature, stand out in relief and will immediately catch the eye of the beginner, and by him be mistaken for essentials of that good style upon which these peculiarities are mere excrescences,

and as such not to be copied. The best style upon which to form one's method of play is that which is free from all striking individual peculiarities, but this, possessing no marked characteristics to attract the attention of the uninitiated, will by them be passed over.

The art of teaching lies in the capacity of the teacher to so modify certain general principles as to bring these within the varying capacities of the taught, so that the best result may be obtained in each individual case. The good self-taught player has, consciously or unconsciously—and most probably the latter—adapted these principles to his own case, and from them acquired a style of play suited to himself. It is, however, more good fortune than good teaching if, in the novice who comes to him for instruction, the expert at the game finds one whom nature has endowed with the same attributes towards success as himself.

The more thorough the study of the game in all its various conditions, the greater will be the progress of the beginner when the opportunity for practice arises, and though theory can never supersede practice, it can smooth and shorten the road to proficiency. It should contain the essence of experience gleaned from the various players who have grown old in the game, and upon which experience the light of intelligent thought has been brought to bear, and from which all that has proved unprofitable has been eliminated. Correctly set forth theory should enable the novice to start with a degree of knowledge in the art to which it is applied at a point which his purely practically taught predecessors only reached after years of toil. But before theory can be an aid to practice its principles must of necessity be drawn so wide as to render it more or less imperfect. Dogmatic assertion should have no place therein. A true theory of any game should be restricted to the summation of its first and general principles, as the application of these to the individual case must, in many instances, suffer modification. In addition, however, to the positive advantage to be derived from the perusal of a treatise on the

theoretical branch of any art or pastime, such may serve the no less important end of focussing the intelligence of others upon the subject and thus conduce to its general improvement.

The qualities, either natural or acquired, which predominate in the game of the expert curler are nerves well under control; an automatic sympathy between eye and hand; a quietness of demeanour which neither exults over the success of a well-played or lucky shot, nor yet grovels in despair, and too often curses, over a bad or unlucky one; a spirit upon which difficulties and odds serve but to throw into relief that resolution which shall overcome them; and, lastly, a degree of eyesight which few players do not naturally possess or can artificially acquire.

The distinction between the "nervy" and the nervous player is simply a question of the presence or absence of that all-important control exercised by the will over the nerves. As this control exists or not, will the player when something more than usual is required—not of his skill as is so commonly assumed, but of his nerve—succeed or fail. In the former case his nerves will, by the strength of his resolution, be made subservient to his will, and the player credited with "nerves of steel"; in the latter they will become his master and produce that unsteadiness, unjustly termed "funk," which is so pitiful to see. As some can end a career of debauchery within the short period the drink-sodden brain takes to regain its normal state, so others go through life with their nerves so habitually under control as to appear to possess none, so little evidence do they shew of their existence during critical moments in their careers. It would be futile to enter into the psychological conundrum as to whether a being destitute of external consciousness of nerves can exist, but if he do, and should be found amongst the ranks of the brethren of the broom, we have more hope in the ultimate success of the nervous, than of the nerveless player. It is from the nervous temperament that heroes are made. It is what keeps the young subaltern, fresh from the playing-fields of

his school or college, at the head of his men during the carnage and death of his first battle ; its possession as a racial trait carried the French soldier through the terrible and disastrous 1870, and won for him amidst his country's ruin the admiration of the world. And how often in the history of brave deeds has the possession of this quality alone turned the erstwhile most timid of her sex into a heroine ?

There is no more common error than to diagnose nervousness as resulting from the want of confidence in one's self. It is not when the player asks of his skill something that he has seldom or never accomplished that his nerves "run away with him." In these circumstances the player recognises that the particular shot is beyond his known skill, and so, fearless of the onus of failure, he sets himself to the accomplishment of his task in the mind most likely to succeed. But it is when the player asks of his skill, perhaps for the twentieth time, what it may have already during the same day accomplished nineteen, that failure of nerve ensues. The shot is the same, but, and here lies the unsteadying factor, the result in the then state of the game means so very much more. There is no want of confidence in his skill. He knows the particular shot is well within the degree of expertness at which he has arrived, but he is not the less certain before he lifts his stone that his customary steadiness of body, hand, and eye have left him, and that he must entrust his success to chance.

If this, then, is what is implied in the use of the term "want of confidence" it might be argued that over-confidence is a desirable quality of mind to cultivate. For a player, however, to feel assured that he can accomplish, when necessity demands, that which is beyond his average skill, denotes a degree of presumption which will speedily work its own cure.

What, then, can be done to assist the nervous player to overcome this unsettling tendency at the crucial moment which calls for the exercise of that skill the component parts of which are a steady hand, a true eye, and unwaver-

ing resolution ? The finest piece of mechanism turned out by human hands is coarse in comparison with that of the mind. What human ingenuity has made it is also capable of rectifying when any part of its work fails to perform its allotted function ; but the subtilties of the human mind are far beyond mortal comprehension. The remedy in most cases must rest with the player himself. He must school himself into a philosophic consideration of the situation. At the worst he can but fail to accomplish what he desires, and if he can see the position so clearly as to resolve to fail with as good a shot as possible, he will be on the right path towards the overcoming of his *bête noire.*

No player has a right to demand more of an opponent than that he shall be outwardly passive to his success or failure, but there are certain kindly natures, whose true sportsman-like qualities are such that they would rather lose as the result of superior skill than win by any advantage derived from playing upon the nervousness of an opponent. Such a player, of course, can do much to help his nervous brother of the broom, but however highly we may rate such conduct, it must not be overlooked that an opponent's loss of nerve may justly be turned to account by the opposite player to his own advantage. It is the method by which this advantage is secured which can alone leave a player's conduct open to reprobation.

Rule 20 of the game provides : " That where any player engaged in the game shall speak to, annoy, or taunt, or interrupt another, not being of his own side, while in the act of delivering his stone, one shot for each offence may be added to the score of the party so annoyed." It is, however, the general experience of players that this rule seldom requires to be brought to the remembrance of those engaged in the game. It provides for a degree of misconduct seldom, if ever, seen upon the ice. But a player may make himself so objectionable to his opponent that, where the latter is sensitive, and therefore almost certain to be of a nervous temperament, his play will be prejudicially affected for the time. For such a case the rules of the

game afford no remedy. The offence is not the less real because it may be implied without direct reference to the play of his opponent, but it is best met by the silence of contempt. Should he, however, retaliate upon his opponent, he cannot justly be blamed, as any subtile chiding in such circumstances would sometimes be futile, and might but lead to an aggravation of the offence.

The degree of eyesight necessary for the pursuit of the game is within the reach of all players. They either possess it naturally or can obtain it by artificial appliances. It is, perhaps, the one essential of the game that all may command, and is probably of least importance. Its exercise in the judging of distance is limited. The exact distance of the tee and hogg-score is always known, and the player has the instruction of his skip between or beyond these distances.

The best method of securing the true line of the shot to be played, whether this be straight or at an angle, is with both eyes. Where the line, however, is taken with either eye, care must be taken that the other is entirely excluded in the focussing process. There is always a tendency with such players to bring both eyes into play at the last moment, and with bad results. They are mostly unconscious of this fault, and impute the ensuing miss to the state of the ice, or to anything but the true cause. If the shot is taken with either eye, and at the last moment the other is brought to participate in the operation, the line of direction is almost certain to be wrong. Where the practice is natural, the player must take the greater care in the process, but it is not one the possession or acquisition of which is, in itself, to be desired.

The most important of all the qualifications of the expert curler is the perfect sympathy between eye and hand. If the position of the body and style of play is such as will leave the free action of the arm unfettered, the conjoined automatic action of eye and hand will follow. Both are governed by the mind, and, where no obstacle intervenes, they will work in unison.

Resolution to a certain extent encroaches upon the domain of nerve, but it also implies the presence of a condition of the mind best conveyed by the term "one-mindedness." Having received the instructions of his skip, or where the shot to be played is left to his own discretion, having made up his mind, the player should concentrate his attention upon its accomplishment to the exclusion of every other consideration. To play a shot with the idea present in the mind that a miss may, perhaps, bring off another lying near, is to court failure. In all games, and perhaps in that of curling more than others, because of the confined radius within which all the stones are lying, luck is ever present. The chances, however, of its favouring the player are beyond calculation. Luck, whether good or bad, is an element in the game which should always be allowed for, but never calculated upon. It has the extraordinary tendency to favour a player when least required, and to leave him severely alone in his necessity.

The game of curling has long been known as the "roarin' game." The name originated from the sound produced by the stone in its journey along the ice, and the term accurately conveys the idea. With a certain class of players, however, a rivalry has arisen between the stones and themselves in the production of the "roarin'." But the game is not the play of overgrown children but the serious sport of men, and it will certainly not be in the true interests of the game if, with the young players entering it, there is also imported a species of hilarity which, however good-natured, is not always the most desirable method of showing exuberant good fellowship.

CURLING PONDS.

By the term "natural loch" is meant those sheets of water created by volcanic or other natural agencies. Such from their size and depth are, at best, but intermittently at the service of the curler. A week of such frost as we may expect, even in the hardest of our winters, is necessary

to make such stretches of water safe for the player, and "king frost," having accomplished this, but too frequently considers that he has done enough and betakes himself elsewhere.

Owing to the "open" nature of recent seasons, the natural loch has been of no use whatever to the curler, but even the youngest generation of players will probably have seen at least once during their careers some large and deep sheet of water upon which the curlers from far and near were holding their gala-day. Such a sight once seen is never forgotten, but it is, alas, of late years an experience which is becoming rarer as each curling season comes round.

Though the natural loch when left *in statu quo* is of little real use to the curler, it may, when the water is not of excessive depth, be made by artificial means to minister to his needs in an increased degree. Such a sheet of water almost invariably possesses an inlet and an outlet. Where any barrier to the free exit of the water exists, the removal of this barrier will materially assist in the reduction of the average depth of the pond, or the outlet may be widened and deepened so that an increased volume of water is carried off.

Where neither of the above methods are practicable and where, as is seldom the case, the pond is not entirely shut in by rising ground, sufficient water may be withdrawn from the lake to flood a piece of more or less level ground in the immediate vicinity. By this means a rough and ready, but not the less effective, artificial pond may be created upon which the game may be pursued under conditions where it could not be played on the pond itself.

The title, "The deep-water pond artificially made" is rather misleading, but in the absence of one as short, though perhaps more explicit, it must remain. No club is likely to go to the expense of purchasing ground for the purpose of turning it into a curling pond, unless such ground possesses certain natural advantages in the

composition of its soil and water supply. There are, however, many shallow pieces of water which, by the expenditure of a little money and trouble, may be made serviceable to the uses of the game. Where an outlet exists it may, as in the case of the deeper pond, be made more effective, and where, as in the case of marsh, none such is present, an outlet can very easily be made. This with or even without the additional process of filling up, will considerably reduce the time necessary to enable the pond to become ready for the game.

In the making of an artificial deep-water pond, we can see no commensurate advantage to be derived from having the water of such a depth as will serve to well souse or even drown a player. The majority of these ponds upon which I have played have invariably had the capacity of accomplishing one or other of these undesirable processes. The difference between curling on deep-water ice and on that of the artificial rink is as well exemplified upon two or even one foot of water as upon water twenty feet deep. So long as there exists between the ice and the bottom of the pond water of sufficient depth to respond to such pressure from above as will take place during the game, that indescribable something, which in the absence of a more explicit term we shall call "elasticity," will be as much *en evidence* upon three inches of ice with a foot of water underneath as when there is a fathom, and the player will experience a much greater degree of confidence when the thaw sets in. The fear of being submerged to the knee or thigh will not deter any true curler from continuing the game until the last moment, but to contemplate a more or less complete submersion may well deter the most enthusiastic votary of "Scotland's ain game."

The results of the tour of the Scottish Curlers in Canada must bring home to all brothers of the broom the fact that, good curlers though the members of the team may be, they are yet inferior to their Canadian cousins in the finer points of the game. Nor is this inferiority surprising. If we consider the respective climatic conditions of the two

countries, and the facilities thereby afforded to the practising of the game, the marvel is not that the Canadian curlers should be the superiors of their Scottish brethren, but that the latter should make such a satisfactory appearance against them.

Unless, however, we can secure the consent of Parliament and a degree of engineering skill which the world at present does not possess, to enable us to divert from our shores the beneficent Gulf Stream, the Scottish curler must be content with such climatic conditions as exist. That he may make the most of these is the aim of this work. It contains the result of fifteen years' experience in the making of artificial rinks of every kind of bottom and the quick procuring of ice thereon.

We can remember a time when, if the natural pond of the district did not freeze sufficiently to bear the curler, his only solace was in the recollection of past incidents of the game and the anticipation of those yet to come. It is true that in the country districts few winters passed without the curler being able to enjoy the sport for some short period, but in and near the towns such seasons were of more frequent occurrence. The artificial pond as it at present exists was undreamed of. But whether it be that our winters are becoming milder, or that we are merely passing through a series of such winters, it is the case that curling clubs which do not possess an artificial rink have for the last season or two enjoyed little of the game.

If, then, the Scottish curler is to make the most of his variable climate, he must be prepared to secure sufficient ice for the purpose of the game with the thermometer three or four degrees below the freezing-point, and to secure it after one night of such a temperature. Even then there are few winters in which the total time it has been possible to play the game will require to be counted other than by days.

The factor prejudicially affecting the more general use of the artificial rink has been the very considerable expense believed to be necessary for the laying down of such. It

has been assumed that nothing but an asphalt or concrete bottom would suffice, and the laying down of such is always an affair of considerable expense and difficulty. It requires the attention of an expert during the whole process. If the asphalt or concrete is not in proper proportion and thoroughly mixed, the result will be their cracking by the frost, and though there is no question that such a bottom can be laid down capable of withstanding for many years the action of such temperatures as we experience in this country, the majority of those I have examined have proved unsatisfactory after a season or two.

With the many evidences afforded by a single night of frost in the frozen pools of water everywhere to be seen, it is strange that the idea that a perfectly water-tight asphalt or concrete bottom must be a *sine qua non* in an effective artificial rink has so long prevailed. The soil always contains a large proportion of moisture—even that driest of all soils, namely, sand—and when this moisture is frozen, but little is necessary to keep a thin coating of water upon the surface for the few minutes required for such to freeze. When once this has taken place, the ice itself becomes a perfectly impervious bottom.

If, however, ice is to be secured within the shortest possible time the spray must be used. With the spray I have found no advantage to accrue from the asphalt or concrete bottom, however perfectly made, in comparison with the natural bottom, after this had received a certain amount of attention. Where, then, it will be asked, does the asphalt or concrete bottom help the curler to the enjoyment of his sport ? If ice is to be built up by means of the spray, the presence of the operator at the rink is essential. Where the pond is any distance off, and it is not practicable to secure the services of one who is always during the winter months on or near the spot, ready to take immediate advantage of every fall of the thermometer below the freezing-point, the asphalt or concrete bottom is of great value to the curler. Upon it a quarter of an inch of water may be left with the certainty of finding ice if, in the meantime, it

has not disappeared through evaporation. The place of the concreted rink is midway between the natural pond and the artificial rink whereon ice is obtained by the spray. It will procure for the curler many days on which curling on deep water is an impossibility, but it will as certainly deprive him of many valuable hours during which curling would have been practicable had the spray been used.

The best natural bottom for an artificial rink is one of pure clay. Where this exists ready to hand, the making of the rink is simply a matter of levelling and rolling. In levelling I have had the best results from a triangular plumb with a base corresponding to the desired width of the rink.

The commonest structure of subsoil is of a mixed nature, and consists of sand, soil, and more or less clay, and it is with these most curlers will have to grapple. More satisfactory levelling results will always be obtained from excavation than from filling up, as subsidence is very likely to result from the latter process. With the above subsoil the best result will be obtained by tar macadamising. Having cut off your rink and removed the surface soil, get your levels and thoroughly roll the rink. Then put on a light dressing of slacked lime, and upon this an inch of finely riddled ashes, and again thoroughly roll. The next part of the process of making the rink is the most difficult, and by far the most important. The tar to be used for the rink may either be applied hot or cold, according as oil is to be added or otherwise, and a pan with a rose is the most satisfactory method of applying it. The proportion of tar to superficial area of rink should be not less than one forty-gallon cask to every five yards.

Having prepared the rink for the reception of the tar by coating it with a light dressing of sand, pour on the tar as evenly as possible, and before it dries give the tar a dressing of sand, and immediately roll until the tar is thoroughly set. Allow the rink to remain in this condition for two or three weeks. After this time roll into it another dusting of slacked lime, and paint over with a mixture of boiled tar

and turpentine. The proportions of this mixture should be about one pint of turpentine to one pail of tar. The best time to make the rink is midsummer, when the heat of the sun aids the uniting, and ultimate coherence, of the whole composition.

In locating your rink—and we think that a direction in a greater or less degree east and west is to be preferred to one north and south—it is of the utmost importance that the situation should be well shaded. The best factor towards the exclusion of the sun is afforded by nature in the form of hills and trees. Artificial attempts at shading the rink are, however, in many instances, the curler's only resource and are at best but a poor substitute for natural shade. The most effective form of artificial shading would, however, be secured by a top-screen stretched along the whole length of the rink. By such a method of shading a free passage would be given to any frost-carrying wind blowing across the surface of the rink, and would also serve to make play possible in the event of snow falling for a longer period than otherwise it would be.

The effective shading of the artificial rink is a necessity if full advantage is to be secured from it. Though upon the three or more inches of ice upon the deep-water pond the action of the sun-rays is reduced to one of condition of ice, upon the thin ice-coating of the artificial rink the effect of the sun-rays becomes a question of ice-existence. It may be true that " as the day lengthens the frost strengthens," but so also does the power of the sun—and the sun is the curler's enemy.

THE SPRAY.

The germ of the idea of the spray as a method of applying water to the dry surface of the curling pond was given to the world so long ago as the year 1830. Mr Cairnie, who, so far as we know was the originator of the artificial rink, says in his treatise: " Where haste is required, the one-quarter part of the quantity of water (125 gallons) will be

found sufficient, and may be applied by two men in the course of an hour, who will find it no great hardship to walk backwards and forwards and sprinkle the surface with the rose of the watering pan."

The maximum density of water is 39 degrees. That is to say, that water at this temperature will contract or expand as heat or cold are respectively applied to it. The expansion which takes place in water during the lowering of temperature between 39 and 32 degrees is sudden and considerable, and is really the primary stage of the conversion of the water into ice. Tyndall says of it: "The process, then, of expansion from 39 to 32 degrees is to be regarded as incipient crystallisation, which ends in the coming together of the poles at the lower temperature." Ice will float upon water because, through the process of expansion, its specific gravity is lessened, and this expansion is a considerable aid to the quick production of ice by means of the spray. An ice-crystal occupies a space one-eighth greater than that required by the water from which it was produced, so that from seven-eighths of an inch of water one inch of ice may be produced. Nor is this all. If we project the water into the air in the form of a fine spray, and allow it to fall upon the rink, we obtain what is termed "white ice." This "white ice" is formed by the secretion within the ice-globule of a certain proportion of air, and by which the bulk of the original quantity of water projected is still further increased.

We now come to a consideration of the best method of using the spray in the speedy production of ice. Allow the bottom of the pond to get the frost for one or two hours if possible, so that all heat is as far as possible evaporated. Then, starting at one end of the rink, project the spray into the air, and walk slowly to the other end, keeping the shower as even as possible. When the farther end is reached, even with four degrees of frost, it will be found that the end from which the start was made is already frozen and ready for another spraying. This process is repeated until sufficient ice is obtained. With an effective

spraying apparatus and four degrees of frost, half an inch of ice may be obtained in an hour. Great care, however, should always be exercised in seeing that each spraying is properly frozen before the operation is repeated, as water sandwiched between the layers of ice militates against the quality and durability of the ice. The spray must be used if ice is to be obtained within the shortest time, and I have found the temperature of the water lowered by two degrees between the time it left the nozzle of the spray and its fall into a basin, after being projected forty feet into the air. The finer the spray, and the higher the projection, the greater is the action of the atmosphere upon the water.

Artificial rinks made in the above manner and ice so procured are not dreams, but accomplished facts. We have not been portraying a curler's Utopia but a condition of affairs in existence since the season of 1902-03. The Watsonian Curling Club, who have their rinks within the Athletic Ground at Myreside, Edinburgh, were the first to lay down artificial rinks with a tar-macadam bottom. Since these rinks were made two seasons ago many curlers have inspected them, and information has been freely given to them. The rinks have stood the test of time. They are easily repaired, and such reparation is not in the form of patch-work, but in re-coating over with tar and other ingredients, and goes towards the general improvement of the bottom. The making of such rinks, unlike those of asphalt or concrete, requires no great outlay in money, nor yet the employment of skilled labour. They are within the reach of all curling clubs, where sufficient enthusiasm and love for the game exists to carry its members through a little manual labour to the desired end. Our sires enjoyed the game with but few accessories other than the strength with which God had endowed them, and let us not seek in the aid of others what we can accomplish for ourselves, and merit the name of degenerate sons of worthy sires.

RADIATION.

The theory of the movable equilibrium of heat is that all bodies tend to place themselves in thermic equilibrium with each other. If the heat given out by any object is in excess of that received from others, its temperature falls; if the converse is the case, its temperature rises. When the heat radiated from any object is exactly compensated by that received from other objects, its temperature remains unchanged.

The sun is the great heat-radiating agent to the earth. The latter in all probability does receive warmth from other planets, but the amount of heat so received is so small in comparison with that received from the larger planet as to be ignored in the present consideration of the subject.

The amount of heat the earth receives from the sun increases hour by hour from its rising until noon, when the heat received gradually decreases until sunset, after which period no heat is, of course, received. The heat-radiating power of the earth whilst approximating to, is not quite equal to, that of the sun, and thus the temperature of the air rises until about 2 p.m., which is usually the hottest period of the day. The coldest period of the day, on the other hand, is just before sunrise, for the reason that at this time the influence of solar heat has been absent from the earth for the longest period, while during this time heat has been continuously radiating from the earth into space.

The effect produced by solar rays depends upon the angle at which they strike the earth. A nearly vertical beam has to pass through a less thickness of the dense lower atmospheric strata than an inclined one, and a large proportion of heat is absorbed by these lower strata.

The first effect of the sun-heat is not appreciably to warm the atmosphere but to raise the temperature of the surface of the earth. The degree of rise in temperature depends upon the nature of the surface, being greatest over bare earth—such as rocks and desert—less over vegetation, and

least of all over the sea. Water is heated by radiation with the greatest difficulty, and retains its latent heat no less obstinately, but land is easily heated, and possesses a relatively high radiating power. At considerable elevations above sea-level, and with the denser and damper atmosphere beneath, the direct effect of solar rays is quite disproportionate to the temperature of the air. At 5000 feet above sea-level one can sit in the sun without a greatcoat, while in the shade near at hand the thermometer may be below the freezing point.

The facility with which heat is radiated from the earth is, as we have seen, rendered easy or difficult according to the nature of the earth's covering. Grass and herbage are better radiators than earth or gravel, and trees, by reason of the increased extent of radiating surface afforded by the leaves, supply the best radiating agent of all. The temperature of a meadow will be found many degrees lower than that of a road passing alongside it; and a thermometer placed over grass will frequently during the night, when radiation is most active, fall several degrees below the reading of a similar instrument placed three or four feet above the grass, if the thermometer is protected by means of a screen from the action of radiation.

From what has been said, therefore, it follows that the location of the curling pond, and particularly of the artificial rink, is of first importance. Trees, whilst of infinite use for shading purposes, also materially assist in the cooling of the surface of the pond through the action of radiation; and the placing of the pond in a meadow is to be preferred to its location within bare earth surroundings. Ice also will be most rapidly obtained if the spray is used when the action of radiation upon the surface of the pond is least.

A striking example of the effect of radiation upon temperature is afforded by the production of artificial ice for commercial purposes in certain parts of India. In Bengal alone many hundreds of natives are employed for several hours each morning when ice is obtained. Under favourable conditions half-a-ton of ice may be obtained from one

ice-bed, and as twenty beds are frequently used, it will be seen that the total quantity of ice obtained is very considerable.

In the manufacture of ice under the abnormal conditions after-mentioned the same method has been followed from time immemorial. A rectangular piece of ground, 120 feet long by 20 feet broad, located preferably east and west is marked out. This is excavated to a depth of two feet, the surface smoothed, and the ground so excavated is left exposed to the sun until thoroughly dried. When the drying process is done, rice straw in small sheaves is laid upon the bed in an oblique direction, upon the top of which loose straw is placed. After the straw has been placed upon the bed its original depth of two feet is raised one foot and a half, thus leaving the surface still six inches below the level of the surrounding ground. The vessels in which the water to be frozen is placed are made of unglazed earthenware, nine inches in diameter at the top, but gradually diminishing to four inches or so at the bottom. The depth is seldom greater than one and a half inches at the centre. The jars are so porous as to become moist on the outside when filled with water.

During the day preceding the night and morning on which ice is desired, the loose straw upon the top of the sheaves is occasionally turned so that the whole may be thoroughly dried by the sun. Towards evening the ice-vessels are arranged in rows upon the top layer of straw, and one-third filled with water. During the operation of filling the vessels with water, the straw must not be disturbed, and this is accomplished by small water-jars attached to bamboo rods, by means of which the operation of filling is accomplished without disturbance to the straw. The quantity of water placed in the ice-vessels, though usually about one-third their capacity, varies according to the degree in which the favourable conditions for the manufacture of ice are present, or likely to be so. The most favourable conditions are provided by a NNW. wind and a clear sky.

In the cold season, when the temperature of the air at the ice-fields is under 50 deg. Fahrenheit, with gentle winds from the north or west, ice will form during the night and morning in each of the shallow vessels. When the film, or first appearance of crystallisation, is observed, the contents of several dishes are mixed together and thrown over the remaining dishes, and this process is believed to assist congelation. Ice usually begins to form about midnight, and continues until daybreak. When congelation is delayed until two or three o'clock in the morning thinner ice results.

The direction and strength of the wind are all-important factors in the process. The most favourable direction, as we have said, is NNW., and according as the wind veers towards due north, or due west, do the conditions become less favourable. An adverse change in the direction of the wind is sufficient to cause the disappearance of ice already formed, and this result will also accrue from a wind otherwise favourable but approaching the nature of a breeze.

The placing of the straw upon the ice-bed accomplishes two purposes. Being a bad radiator of heat, the sun-rays do not penetrate far during the day, whilst radiation from below is also checked. The porous nature of the ice-vessels also assists in the riddance of a certain proportion of heat which was latent. The wind during the night usually falls away, leaving a calm atmosphere, or at most one stirred by gentle zephyrs, and although the thermometer three feet above the ice-pits may register 48 degrees, the temperature between the ice-vessels and the straw will frequently fall to 27 degrees. So powerful, indeed, is the cooling effect of radiation in the tropics upon a clear night that it is no unusual sight to see dew congealed into ice upon the leaves of plants.

The curler of the past, whilst willing to use his physique in the game has not employed his mind towards either its improvement or the increase of opportunity for playing it, but it is not the less true that in both respects much may be accomplished. He, in common with most of his genera-

tion, too readilly assumes that what is not known to-day never had, and cannot have, any existence. Perhaps the above instance of acute observation amongst a people, and in an age beyond record, may induce him to doubt the inception and finality of that little knowledge which we claim for civilisation, to the exclusion from all participation therein of the countless ages to which this civilisation is but as yesterday.

THE LIGHTING OF THE POND.

ELECTRIC. Where the artificial pond is in near proximity to towns where the electric light is used for public purposes, and where a connection can without difficulty be obtained, the effective lighting of the rink is an affair of no difficulty. Great care, however, should be taken with this light, and in a lesser degree with the incandescent gas, that the lamps are so placed that the player's eye will not even momentarily become focussed upon them in the ordinary course of delivering the stone.

Where practicable the electric light is unquestionably the best method of lighting the pond. The globes require less cleaning, the light can be switched on and off so easily that there is no waste during any adjournment of the game, and its immunity from the action of wind is not the least of its claims to the favour of the night-curler.

INCANDESCENT. Of the various methods for increasing the power of gas, the incandescent, so far as mere intensity is concerned, is the best. In the billiard-room there is no light superior to this, but the conditions there existing are considerably modified on the curling rink. The action of the wind upon the mantles is very destructive, and however great be the care taken to exclude draughts, the mantles have proved a continual source of annoyance, necessitating continual replacing.

GAS. Another method of increasing the power of gas is by the multiplication of burners within the lamp. Of course in this case there is no saving in the quantity of gas consumed

as in the case of the incandescent, nor is the light so brilliant or far-reaching. Against this, however, must be placed the cost of mantles.

To remedy the want of brilliance in the ordinary gas jet much can be done by reflectors and the construction of the lamp. The whole idea of artificial light for the curling pond is yet in its infancy, and it is only when curlers cease to regard night curling as a curiosity, and have come to look upon it as an institution, that the effective lighting of the pond will receive the attention it merits.

In country districts where oil and candles are alone at the service of the enthusiastic curler who wishes to steal from the night some hours for the pursuit of the game, the choice of light to be used is considerably restricted. Candles, whilst serving to make the darkness visible, are incapable of affording that efficient minimum of light without which the game cannot be enjoyed. Of the oils at the service of the curler the two almost invariably used are naphtha and paraffine, though they are used in very different ways.

NAPHTHA. This is a natural oil containing carbon and hydrogen, and is highly inflammable. There are few who are not familiar with the flaring lights outside the booths of the country fair. The light is a very powerful one, and under good conditions, as in the absence of wind, burns steadily. The light, however, being an open one, and incapable of being enclosed within a lamp, consequently cannot be focussed upon a particular area by means of reflectors, and therefore much of its power is lost. The wind, too, is a factor which in our climate we must never omit from our calculations in lighting operations.

PARAFFINE. With due regard to climatic conditions and the necessities of the curler, paraffine will be found to be the oil best adapted to the lighting of the pond. Lamps of 50 candle power can be procured at a cost of 15s. 6d. each, and those of 100 candle power for 6s. more.

The illuminating area of these lamps can be materially increased, and the light itself rendered more powerful, by the lamps themselves being enclosed within a specially designed

case. Such cases can be bought, but this of course adds considerably to the total cost of the lamp, and any practical joiner on being shewn what is desired will speedily, and at little cost, provide what is requisite. The case should be 3 feet high by 3 feet wide at the back with sides converging to a width of one foot and a half in front, and deep enough to admit the lamp. The floor, roof, and back of the case may be of wood, the front and sides must be of glass. The roof and floor must be well ventilated with air-holes, and the back should be painted white as it is intended primarily to reflect the light. Within the case, over the funnel of the lamp and midway between it and the perforated top, a metal disc should be hung. The purpose of this zinc disc is to dissipate over a larger area the heat rays emanating from the funnel of the lamp, which if allowed to focus themselves upon one particular part would speedily set fire to the case. With the metal disc and sufficient air-holes the possibility of fire is reduced to a minimum.

Artificial rinks are not infrequently laid down one at a time, and where this is so it is well to see that the piping, if gas is the illuminant, is laid down on that side against which the second rink, when made, will lie. The fact of having the piping ready laid between the two rinks will, when the second is completed, result in a considerable saving of labour and expense. The number of lamps which will efficiently light one rink, will no less efficiently light two, when the lamps are placed between them, and any shadows that are then thrown will be straight and not distorted. A white screen at either end of the rink will materially help to throw into relief the stones around the tee.

In the artificial lighting of the curling pond it is as unwise as it is needless to attempt to rival the light afforded by the orb of day. From the crampit to the tee is but a distance of 42 yards. If a player can follow his stone until it reaches the farther hog-score, and beyond this see distinctly such stones as are lying within the "house," sufficient light is present for the skilful playing of the game. Beyond this it is futile to go, and if the rink be shaded by means of a

white or light coloured top-screen, this will materially help towards securing the degree of light necessary for the playing of the game.

To those who have curled much by night the game assumes a charm unrealised by those who follow it by day alone. The stillness and hush of the night are accentuated by the voices of the players—beyond is darkness and mystery. And when the game is over, and night reclaims her sway, a universal silence settles upon the scene whereon we have been playing the greater game of life in miniature—a little while upon the stage and then—farewell.

CURLING STONES.

As the aim of the author in this work is to set down as little as possible of matter which will not be of practical utility to the player, we cannot do more than cursorily glance at those ancient stones which have played their part in the evolution of the game. One of the most famous was called the "Hen," and was a notorious stone with the curlers of Dumfriesshire during the first quarter of last century. Towards the end of that period the Channel-stone was coming freely into use, and even the most enthusiastic admirers of the "Hen" *et hoc genus omne*, began to see and appreciate their deficiencies. Compared with the lighter, and more workable, channel-stone, these unwieldy masses of rock did not contrast favourably. Where they settled there they remained. If, unfortunately, these mighty stones rested on the tee, the game was won, even though, as often happened, it was the first stone of the end. If such a stone came to rest upon the howe ice, and over the hog score, though not within the house, the end was not infrequently ruined. With the stones then in use, to obtain any twist or curl was difficult, unless the ice was heavily biassed, and any attempt to curl round the huge obstruction was as futile as an endeavour to raise its dead-weight of 100 lbs. or more was hopeless.

The Channel-stone succeeded these huge unwieldy masses

of whinstone, and with their introduction into the game the first revolution was given to the wheel from which was eventually to evolve these beautiful and highly-polished stones which we now regard as a necessity of the game.

Previous to the advent of the Channel-stone, those used in the game largely consisted of sea-stones of every variety, weight, and shape. These stones belonged to no particular player, but were regarded as the joint property of all the curlers in the district, and to be used for the day by that one of them who, on the principle of "first come first served," acquired the temporary right to their possession.

With the coming into use of the Channel-stone, however, an ill-defined, but generally recognised right to the possession of particular stones began to arise, and the evolutionary wheel was again set in motion towards the general improvement of the curling stone. So long as all stones were possessed in common, the necessity of using an ill-shapen, rough-soled stone to-day resulted merely in the resolve to secure, by an early arrival at the pond, a better stone on the morrow. But when the right of a player to particular stones began to be recognised, this easy solution of the difficulty was no longer open to a player. He found that he must either obtain other stones to his satisfaction—a by no means easy matter—or improve those to the possession of which his claim was not questioned. To do this, if not himself a worker in stone, he had to seek the assistance of a friend or acquaintance who was, and might not improbably require to pay for such services. Thereafter the right to the possession of such stones would be most satisfactorily established in his own mind, and we have little doubt his claim would be generally recognised by his brethren of the broom.

The geological structure of the stone best adapted to the wants of the curler is that specifically known as granite. This is a crystalline unstratified rock composed of quartz, feldspar, and mica, and presents in most cases a whitish, greyish, or flesh-red colour. The mica in this species of rock does not run in planes, and is therefore destitute of

schistose structure which, in plain language, means that the tendency to break, as distinct from chipping, is reduced to a minimum.

The component parts of granite vary in the degree in which they are severally present, and produce corresponding differences in colour, density or specific gravity, and durability of the stone. The rock will sometimes resist for ages the decomposing effects of atmospheric conditions; but will at others become disintegrated within a comparatively short period, and between these two extremes there are varying degrees of durability.

The advantages of the granite structure of rock for curling stones are many. Its power of resistance to the penetration of water, if not absolute, is very great; its liability to break into large fragments is infinitesimal, whereas the ease with which it can be chipped enables it to be manufactured into the requisite size and shape; and the close and intimate relation of its component parts admits of the stone being given a degree of polish which upon rock of a looser formation cannot be obtained.

As we have no desire to divert the enthusiasm of the curler into that of the geologist, sufficient has been said on the structure of the granite from which the curling stone is made to enable the player to enter into the purchase of his stones with an intelligent interest. Nothing is so disheartening to the beginner in the game as the breaking of stones for which he has paid a good round sum, within a season or two of their purchase; and nothing is more satisfactory than to find, as each curling season comes round, the stones with which we have helped our rink to victory bearing upon their surface the evidences of battle but none of decay.

In this most ancient of all games which has come down to us in anything at all resembling its original form, one would naturally expect to find the material from which the *sine qua non* of the game, the stone, was made to be various. Nor is this anticipation falsified. There are few kinds of stone which generations of curlers have not impressed into their service; and though it would serve no practical pur-

pose, and would indeed be impossible to mention all, yet this treatise would be very incomplete were it to pass over all in silence. Though the kinds of granite now used in the manufacture of the curling stone are comparatively few, yet there are many stones made from other kinds of rock still, after being used by generations of curlers, doing good service upon the ice. The reason why the manufacturers of curling stones have restricted themselves to the use of certain forms of rock is not because good stones cannot be made from others, but because the proportion of flawless material is much less in the latter. The following is a short list of some of the best-known rock from which the curling stone is made :—

MENNICK WATER. Dark steel-grey and deep blue approaching to black. The former is good for hard ice, but fails on soft. The latter is eqally good on both kinds of ice, and is altogether a high-class stone.

OCHILTREE. This stone is hard, dense, and durable, and is little affected in its running by the condition of the ice. Also a high-class stone.

NEW CUMNOCK. Blue grey. Some of these stones possess all the qualities of the Ochiltree. Others, however, are very inferior, chipping easily, and running dour.

DOUGLAS WATER. Light grey, and an excellent stone.

BATHGATE WHIN. A very good stone.

BLANTYRE, or HAMILTON BLACK. This is a stone which, if it do not rank first amongst all stones, is certainly the equal of the best. They are very rare, and the fortunate possessors of them regard the stones more as articles of vertu than of use, and they are but seldom seen upon the ice. Several pairs are now in the possession of Colonel Peter Forrest of Haremyres, the enthusiastic Secretary of the Braids United Curling Club, who, I have little doubt will be happy to shew any true lover of stones his specimens. The polish which these stones take as compared with the Craufordjohn is, as nearly as we can describe it, as satin is to velvet.

PORTSOY. This is a white stone, and was once used by

potters to grind their flint, a purpose to which it was well adapted because of its excessive toughness. It takes the highest polish, and by the curlers of old was considered the best of all stones.

Drummelzier. A white stone slightly veined with black. A very hard stone, non-porous, and takes a high polish. These stones are very rare.

Plum-Pudding Stone. A stone of varying quality in the different districts in which it is found. It takes a high polish, but has a tendency to knap.

Copinsha. A dark-coloured species of limestone, which on examination appears to be dense and well adapted for the purposes of the game, but which on trial is very frequently found to be worthless.

Ettrick Forest, or Traquair. This is a red stone of hard quality and very durable. It takes a high polish and runs well in all conditions of the ice, and is altogether a high-class and beautiful stone.

With this brief mention of the various kinds of rock out of which curling stones in the past have been made, we must leave this branch of our subject, full of interest though it may be to the curler of antiquarian or geological tastes, and come to the rocks now most generally used for the above purpose.

Amongst the granites used by the manufacturers of curling stones at the present time, the first mention must be made of the universally appreciated Craufordjohn. A good stone of this description is alike one of the truest and most beautiful seen upon the ice, and a player cannot be better advised than to become the possessor of a pair of "Craufords" at the outset of his career in the "roarin' game." There are many "Craufords" being played with to-day that have been in constant use for half-a-century or longer, and it is not possible to set any limit to the period over which their use may run, if periodically repolished.

The time was, and that well within living memory, when the demand for Craufordjohn stones was very limited, and the supply was easily met from masses of the rock either

left uncovered by the earth, or easily got at, and most of the old " Craufords " were made from boulders of this description. But with the recent boom in the game this supply was soon exhausted, and blasting operations had to be resorted to in order that the supply of the rock hidden in the bowels of the earth might be reached. Stones manufactured from the quarried rock are more or less liable to possess flaws, and do not occupy so high a place in the opinion of players. With the exercise of great care, however, in their selection of the rock the makers are able to supply a limited yearly number of guaranteed " Craufords." The demand for these stones is great, and must as time goes on become more and more difficult to meet, and even at the time of writing, with two consecutive disappointing curling seasons, the demand is greater than the supply. Whilst these quarried stones cannot be expected to last as long as their great progenitors—because in addition to the possibility of injury to the rock during its excavation, the rock itself has not been tested as the boulder was by decades, and perhaps centuries, of exposure to all kinds of weather—yet these guaranteed stones will at least see their owners through all their matches and bonspiels.

Following close upon the Craufordjohn in excellence and in the estimation of the curler comes the Ailsa. This is a light-grey stone mottled with black, and in design not unlike a partridge egg. It is a hard and dense rock, and one of its varieties, the blue hone, is a keen runner on the softest ice. The great objection to it is its comparative lightness when compared bulk for bulk with the Craufordjohn.

The Ailsa granite is classed as common, blue hone, and red hone. The two latter derive their classification from the predominance of certain constituents in the particular mass from which the stone is cut, and which produce the blue and red shade of colour respectively.

The common Ailsa shares with every other stone now seen upon the ice the quality of giving satisfaction so long as the ice is keen. But in selecting stones that player is

ill-advised who allows his decision to be guided, or even influenced, by what any particular class of stone can do under perfect, or even good, conditions of the ice. There is no class of stone now used which, under good conditions of ice, and in the hands of a good player, is incapable of giving satisfaction. It is only when the condition of the ice ceases to be good, and more especially as it descends the scale of " badness," that the worth of any particular class of stone becomes apparent. Tried by this standard the common Ailsa is worthless.

The blue hone Ailsa is the description of this class of stone now most commonly seen in the hands of good players. It is a beautiful stone, and will give satisfaction on the dullest of ice. One objection to it, however, is that the difference in the running powers of the dull and keen sides is too great. It is sometimes found that a stone cannot reach the tee on the dull side, and when changed to the keen, the result is the other extreme, and no matter how quietly soled, the stone will run through the " house," or if the shot be to another stone, unless the latter is struck fair, which in the case of a wick it must not be, the played stone cannot be kept within the " house." This, however, is not urged as an objection to the class of stone, but rather to the make of certain recent specimens. With a larger surface in contact with the ice, or even if it were cupped, the stone would be brought within the control of the player.

The red hone is by far the most expensive of the Ailsa species of rock, and the satisfaction it affords its possessor is not commensurate with the difference in price. Its excess in price over its kind is the result of its comparative rarity.

The Ailsa is an unusually hard granite, and is well adapted to withstand the action of much lower temperatures than we experience here in the old country. For this reason many pairs are annually sent to Canada, where it is freely used along with, if not instead of, the indigenous iron stone.

Burnock Water. This is a dark-grey coloured stone,

and resists water admirably. The objection to it is its extreme brittleness.

In the year 1838 was founded the Royal Grand Caledonian Curling Club. The title was changed in 1843 to that by which it has since been known—the Royal Caledonian Curling Club. Previous to the institution of the Royal Club there was no rule as to the size, weight, and shape of the curling stone. Those first used retained that shape to which nature and the elements had moulded them. When the time came that the assistance of the local stonecutter was called in, the shape and size of the stone was governed by the fancy and strength of its owner.

The tendency of all players of the past—a tendency still too frequently seen—was to play with stones which required the exercise of the whole physical power of which the player was capable to propel as far as the tee. The curler of yore had herein no option. He had to play with the stones as nature had left them ready to his hand. But even when art began to play her part in the shaping of the stone by ameliorating the excrescences of nature, tradition too often stepped in and prevented the otherwise intelligent player from exercising his own judgment as to the weight of his stones. Tired muscles, innumerable "hogs" when the ice was dull, badly laid down shots and misses were the consequences of reducing the game to a mere question of muscular power, which, if the player did not possess, he had, for the sake of his *amour propre*, to assume.

From the first promulgation of rules by the Royal Club for the conduct of the game, the unvarying tendency has been, in all rules governing the weight of the stone, towards reduction, until at present the official promulgation reads: "All curling stones shall be of a circular shape. No stone, including handle and bolts, shall be of greater weight than 44 lbs. imperial, or of greater circumference than 36 inches, or of less height than one-eighth part of its greatest circumference."

No one is competent to decide what weight of stone is best suited to a player but the latter himself, and he only

when he understands, and exercises, those test principles which are common to the selection of implements of every game where strength and skill are conjoined. The batsman who understands his art selects that bat which, whilst of sufficient strength, and therefore weight, to bring off a powerful drive, is yet capable of being used freely from the wrists and bringing off those late " cuts " which every player would fain emulate. If the weight of the bat is of such prime importance to the cricketer, standing solidly upon the ground in a more or less natural position, how infinitely greater should be the consideration which the curler gives to the weight of his stones. In this consideration, the idea of " lightness " must be absolutely discarded. The curling stone, whatever its weight, is never light. The majority of players use stones varying between 35 and 40 lbs., and few players are likely to descend much below the former weight. The position of the majority of players during the process of delivering the stone is not such as is calculated to ensure the perfect steadiness of the body during the evolutions of raising and propelling a heavy weight a distance of forty-two yards or more, and any oscillation of the body is more or less fatal to the success of the shot.

The human body is so constituted that whatever task the will sets before it that it will either perform, or in the effort to accomplish that which is beyond it, some vital organ will give way. If the lifting and propelling such weights as the average curling stone formed part of the daily work of a player, a few pounds more during the short curling season would be of no consequence. But such is no part of the day's work of the average curler, and as the seasons come and go, he too often forgets that age, whilst not detracting from the serviceable qualities of his stone, is slowly reducing his own strength and plasticity of body. But the frost comes, and the curler of middle age or beyond it throws down mayhap his pen, and leaving a more or less sedentary occupation in which he has been engaged for many consecutive months, hies him to the ice, there to perform work which, by comparison with that in which he is daily occu-

pied, is that of a giant. It is towards the end of a long day's play, and upon players of this type, that the extra pound or two will tell. But their enthusiasm carries them through. Should the frost continue, the body will soon adapt itself to the performance of what is, but should never be, a task, and one, too, which after the meridian of manhood has passed will yearly increase in magnitude, and the efforts to perform which will militate against that skill that in the past had obtained for such a player pre-eminence amongst his fellows.

The correct shape and extent of that part of the curling stone which comes in contact with the ice during its running, and commonly termed the " sole," has always been a source of much diversity of opinion amongst players. Before the stone was made reversible, thus securing a dull and a keen side upon which it might run at the option of the player, the width of the sole was of the greatest importance. A player being unable to change from the dull to the keen side according to the condition of the ice, was very naturally anxious to secure that width and form of sole which would best adapt itself to the varying conditions of the ice. It was then maintained by many of the best players that the diameter of the sole should not be less than seven inches. They claimed for such a sole a truer running, because with such a width, and consequent hold upon the ice, the stone was less likely to be diverted from its course by any bias of the ice. With such a width of sole it is hardly necessary to say that a high state of polish had to be maintained if the stone was to be of use on dull ice.

The majority of the stones now used possess a sole averaging between three and five inches in diameter, but even now, when we possess reversible stones, the question as to what is the best diameter for the sole of the curling stone is still an open one. It is not a matter upon which to dogmatise. It is largely a question of the particular class of stone used, and the degree of polish in which it is maintained. The smaller the pivot on which the stone revolves, the greater is the tendency for the stone to " wobble," and

the less will it be affected by any twist given to it; but the more thoroughly the player has acquired the art of soling his stone, the greater freedom will he possess in the discardance of infinitesimal distinctions in the width of sole.

The sole of the curling stone on the dull side is now invariably "cupped." The flat-soled stone is dour upon soft ice, because of the quantity of soft surface ice, or "slush," with which it comes in contact; whereas, the same diameter of sole "cupped" will run better, because though the circumference of the base in contact with the ice is the same in both cases, in the latter the surface within the "cup" is passing over, or what is more probable but lightly touching, the obstruction. Some theorists, in their endeavour to explain the better running of the "cupped" sole, suggest that a vacuum is formed within the "cup." It is, however, no easy matter to create a vacuum even in the laboratory, unless with the most perfect instruments, and we cannot conceive such being created within the "cup" of the curling stone.

In olden times, when curling stones were regarded as common property, and even at a very recent date, it was the custom to leave them by the side of the pond from season to season, alike unprotected from the storm and the calm. In this uncared for condition they were cared for most. Now, however, that the stones possess a value then unknown, this practice is no longer practicable. The stones should, however, be left exposed to the elements in some safe place.

Both sides of the curling stone should be kept in good condition, and as far as possible the respective soles should be maintained in a uniform condition. This end can only be attained by frequent recourse to the polisher. It is only thus that a player can always be certain of knowing the running of his stones. Frequent re-polishing is now necessary, because if a player avails himself of the opportunities of playing the game afforded by the artificial rink, he will not only use his stones more, but the quality of the ice upon which he plays will sooner rob the stone of its polish

than if he had confined himself to the keen smooth ice of the deep-water pond.

Enough has been said to enable the young curler to choose his stones with intelligence and discrimination. The granite, whinstone, or other rock structure from which curling stones have been made, varies in quality not only in the different masses in which it is obtained, but even in the same mass. If a player is the fortunate possessor of stones which have done effective service in the hands of some good curler of a former generation, let him not pass these over because of any general condemnation of that particular class of stone. It is a simple and inexpensive process to have these reduced and polished so as to carry them into line with the stones now in use. If such stones have done good service in the past, they will see him satisfactorily through all his bonspiels until that time comes, from which not even the curler is exempt, when he must leave his cherished "stanes" behind, and wend his way alone to that universal bonspiel which is the last and greatest for us all.

HANDLES, ANCIENT AND MODERN.

The earliest of our curling ancestors had but little in the shape of a grip, and nothing at all approaching the modern conception of a handle, to assist them in propelling and guiding the stone in its course along the ice. In the absence of anything better, they had to be content with such assistance as was afforded by a niche or two cut upon the upper side of the stone, and in which the thumb and fingers were placed. It has been suggested in obviation of the difficulty of playing the game as we now know it by stones held in such a way, that the game then comprised a throw before the stone settled down into the motion with which we are familiar. It seems to us, however, that this explanation does not lessen but increases the difficulties which the ancient curler would require to overcome in regard to his command over the stone. Be that as it may, there are few players of this generation who would care to tempt Dame

Fortune upon the ice with so slippery a hold upon their stones.

The first handles properly so called were made of wood. Of these, such as were naturally shaped to afford a good grip of the stone were long preferred to those turned upon the lathe or otherwise, and of the naturally shaped handles those obtained from the thorn tree were esteemed the best. An excellent specimen of this description of handle attached to the stone is in the possession of Mr John Watson, of the Waverley Club, Edinburgh, one of the best curlers of that older school whose conception of the true spirit of the game we would fain see carried forward for all time.

The thorn handle remained in use amongst players long after the introduction of those of brass and iron, but whether this arose from some innate excellence in the thorn handle, or from a crudity of workmanship to be expected in those first manufactured in metal, or from an amiable prejudice in favour of the thorn with which their memories of the game were associated, it is now impossible to say.

The shape of the modern handle for the curling stone is familiar to all players and requires no description. It varies to a certain extent in the degree of curve, in some even approaching a right angle, but in essentials the handle seen upon the ice to-day is the same as that used by the player of half-a-century ago.

Are we to assume from the fact of the present handle being so long in use that it is the *beau ideal* of what the handle for the curling stone should be? In every other department evolution has played its part towards the general improvement of the game. The stone, the rink, the rules for the better regulation of the game, have all come under the beneficent wheel of progress—the handle alone has been severely left alone.

The first essential in a good handle is that it should not only permit of, but secure, the equilibrium of the stone during the evolutions of lifting, swinging, and soling it upon the ice in the ordinary course of play. With the handle generally in use at the present time this perfect balance of

the stone is seldom maintained, and then only if the handle is gripped where it never was intended to be held—well under the curve. In the event of the handle not being held well under the curve, there is invariably a list of the stone to one side or another, according as the handle itself is held.

At the beginning of the season of 1903-04 there was placed on the market a T shaped handle for the curling stone, which has given complete satisfaction to those who have tested it thoroughly. The advantages claimed for this handle over those in more general use are many, and, we think, well founded. If the stone be lifted with the fingers evenly divided, or otherwise as is most comfortable for the player, the equilibrium of the stone is secured during the process of soling it upon the ice. The centre of gravity being always under the player's hand, a heavier stone can be played with as much facility as the lighter one to which the player has been accustomed with the ordinary handle. The handle is under the perfect control of the wrist, to the motions of which it naturally adapts itself, and whatever twist it is desired to communicate to the stone, is obtained by the merest touch of the finger. In the case of a straight shot, where no twist is desired, the stone being placed upon the ice on a true sole is less likely to receive any unconscious twist, which in the case of a straight drawing shot would militate against its success.

"The Bowie Perfect Balance Handle"—to give this T shaped handle its proper title—is certain, like all pioneer efforts at improvements, to meet with opposition. From those old players whose day upon the ice is drawing to a close, and to whom the game as they know it, and the implements which they used, must always constitute "the game," any alteration or improvement in its implements is not unlikely to meet with strenuous opposition. Far is it from our wish to disillusion them from their conception of the game, and rudely open their old eyes to the unreality of their dream. But curling, like golf, has ceased to be regarded as the old or middle-aged man's preserve. Within the last few years hundreds of young men, and even ladies,

have taken up the game. These bring into it a vitality and physical adaptability which those who enter into the game at a later period of life, or those who have long followed it, cannot be expected to possess, and to these young players every effort to perfect the implements of the game which make for skill should appeal.

There is no royal road to success in curling. The only sure path is the plebeian one of intelligence and determination to succeed. The limited facilities for play afforded by the climatic conditions of our country leave little enough time for the acquisition of skill in the game without the additional handicap of imperfect implements, and though good tools cannot of themselves make an expert workman, they enable good work to be more easily and more expeditiously accomplished.

THE HACK AND CRAMPIT.

In recent years much controversy has arisen as to the respective merits of the hack and crampit as a means of securing for the player a sure foothold upon the ice during the delivery of his stone.

The player accustomed to the hack maintains that he is severely handicapped when forced to play from the crampit, and *vice versa* in the case of the player accustomed to the crampit, but who, for the nonce has to play from the hack. The disputants on either side have reason with them. It cannot be denied that to be deprived of the foothold to which one has been uniformly accustomed, and forced to play from one altogether new, is a severe handicap upon the skill of any player, and though we think this handicap is greater in the case of the player used to the crampit, yet it cannot be disputed that such is also very materially present when the case is reversed.

In this state of matters, and having regard to the fact that both kinds of foothold cannot always be at the option of players, it is in the true interests of the game that in the event of either requiring to be excluded, it should be that

form of foothold which is not always practicable. Were the question one merely of expediency, it seems just that the comfort of the great majority of players should decide the matter rather than the partiality of the few, for the latter cannot but admit that the foothold afforded by the crampit is a sure one. The question is one which necessity must frequently settle in favour of the modern foothold, and where not settled thus, or where the option of the foothold to be used cannot be given to each player, the wishes of the majority must decide the point.

The use of the crampit has largely superseded the ancient hack, and with the development of the artificial rink, the time is not far distant when the latter will be altogether excluded from any place in the game in this country. The use of the hack on the artificial rink is not practicable, owing to the thinness of the ice, and a hack made in the bottom of the rink will not obviate the difficulty. As the greater number of our games in the future will undoubtedly be played upon the artificial rink, the sooner the hack is excluded from the game the better it will be for its interests. A player cannot be expected to vary his foothold between such extremes without seriously prejudicing his skill.

The chief argument adduced by players from the hack in support of its assumed superiority over the crampit is, that the former enables the player to get nearer to the ice. A little consideration will shew any but the most prejudiced upholder of the ancient foothold that, even were the above argument a sound one, there can be far too little in it, *ipso facto*, to outweigh its disadvantages. So long as a player is within easy touch of the ice with his stone, an end attained not by any infinitesimal difference in the level upon which he may stand, but by the position assumed in play, it is of no consequence, unless as a gymnastic exercise how much of his body might follow.

Before the invention of the crampit, certain players, not caring to use the hack, were in the habit of affixing to the boot under the large toe, two separate pieces of iron connected by means of a screw, and attached to the sole of the

boot by a screw nail. The adoption of the crampit, however, did away with this inconvenient method of foothold, and consigned it to that oblivion from which we resuscitate it for the purpose alone of reference.

We fully appreciate the reverence with which certain players regard the ancient landmarks of the game, and sympathise with the tenacity with which they cling to them; but whilst doing so we realise that the game must progress. We have artificial rinks which enable us to pursue the game under conditions undreamt of by the curler of even twenty years ago: we have stones which possess a beauty, convenience, and running power unseen by the old curler of to-day in his youth; and the hack too, we fear, will soon have passed away. The broom alone retains that pristine splendour of position from which it is unlikely ever to be displaced. But though the evolution of the game relegates certain of its traditions to the past, the memory of their existence cannot be dimmed by time in the minds of all true lovers of the game. These traditions are indissolubly associated with the skill of those old giants of the game whom, if he cannot excel, the young player may at least strive to emulate.

STYLE.

In most of the sports which occupy the youth and manhood of the country, the acquiring of a good style by the player at the outset of his career is generally recognised as the easiest, and we think the only sure path to success.

In fencing, cricket, golf, and many other games, the position the player has to assume is more or less the upright one intended by nature, and yet the question of style is regarded as being of the most vital importance. In curling, on the other hand, where the player, handicapped by the swinging of a heavy stone, has also to assume a position more or less that of the invertebrate animal, the style to be cultivated is left wholly to chance, with the result that the player's position and method of delivering the stone is almost certain to be wrong.

To have a clear idea of what is comprised within the term "good style" is to have progressed half way towards its attainment. If a player possesses a correct knowledge of the principles of style in the particular branch of sport in which he wishes to excel, and is capable of modifying these principles so as to meet his own case, he will find that during the course of his career he has little to unlearn as to position and method.

In all games the acquiring of a good style at the outset of the player's career is a comparatively simple process; but the eradication of a bad style of play is full of difficulties and disappointments. The canons of good style are not arbitrary, nor are they necessarily the method of any player however expert and great his reputation. They are capable of modification, and their foundation rests upon a correct knowledge of the anatomical structure of the human body, and its average capacity considered relatively to the attainment of a certain end. The player who has contracted a bad or faulty style, and has by intelligence and resolution overcome his errors is entitled to our highest respect; but *brevita est vita*, and unless it be that others by knowing the result of his experience may avoid his errors, it is difficult to understand what advantage has accrued. The time he has devoted to the game has been unprofitable to the extent of what has been given to the acquisition and eradication of error.

Upon the ice, as upon the links and the cricket field, one often sees as the attributes of good players atrocities in position and action which set at defiance every recognised canon of good style. The possession of a good eye, and the degree of perfection to which it may be brought by relying upon it to the exclusion of other faculties, will carry a player far towards success in most games. But it is not the less true that such a player does not excel *because* he rides rough shod over all generally recognised rules of style, or *because* he depends more or less entirely upon one organ of the body to the exclusion of others, but *in spite of this.* Genius may refuse to be trammelled by rules and yet suc-

ceed in reaching a high standard of excellence, but the wise beginner will enter into the game with that modest appreciation of his own capacity which is ever ready to seize those aids to the overcoming of the difficulties which beset his path towards success. Carlyle has defined the quality of genius as "an infinite capacity for taking pains." We may doubt whether the possession of this capacity without the "divine afflatus" could ever produce a Shakespeare, a Dante, or a Milton, but it is not the work of the true genius which is characterised by slovenliness, but that of those whose only claim to the title is the facility with which they discover and propagate its imperfections.

What is the experience of the average player on his entrance into the game? He has accompanied a friend to the curling pond, where it is found that his services are required to make up a rink, and he is cajoled into joining the game. He is provided with a pair of stones which are certain to be at that stage of his incapacity far too heavy. The use of the crampit is explained to him, and he is left beside an opponent whose knowledge of the game is probably greater than his own—it certainly could not be less. We shall give the tyro every advantage, and assume that his *vis à vis* is already a curler and plays first. The tyro will carefully watch the latter's method of standing and delivering the stone—two things which few players could form any true idea of under such circumstances. Now comes the voice of the skip—"Just lay me a stone here, sir!" The novice who had concentrated his attention upon the method of play of his opponent, now concentrates it upon the shot he has to play. In his anxiety to make a good appearance in his new *rôle* of "curler," he gives his whole mind to the accomplishment of his skip's desire, with the result that the vague idea he previously had as to position and action is at once forgotten. We need not follow him further. His experience has been the same as that of all of us. Fortunately, the game possesses a charm in which the ignominious failure of our first attempts are soon forgotten.

An average degree of skill is more quickly acquired in curling than in any of the great games of our country. The golfer who has played the game for a year is seldom, if ever, capable of holding his own against even an average amateur, and such assistance as he can afford in a foursome is invariably in the form of a handicap. At the ice-game, however, I have known players of a dozen days' experience giving a lead which could not have been improved upon by the most experienced. Unfortunately, many players when they have reached such a degree of proficiency consider that they have learned the whole art of the game, and pass through season after season with little, if any, improvement in their play.

Curling is more or less a mechanical game. Whatever the shot, the action of the player need not change, and he can take his own time, within reasonable limits, before delivering the stone. The condition of the ice may vary between the extremes of good and bad, but so long as the game is playable it must retain certain attributes peculiar to itself. For these reasons, the possession of a good style, though not less important than in other games, is easier to attain, being limited to one purpose—the true delivery of the stone.

The best style is that which possesses but little attraction for the eye of the spectator ignorant of the difficulties of the game. That in which the whole body is so truly poised that the muscular exertion necessary for the lifting of a weight anywhere between thirty-five and forty lbs., and its propulsion a distance of forty yards or more, appears to the uninitiated onlooker a feat of no great magnitude. The cultivation of mannerisms whether in style or conduct is to be avoided. These will not add to the skill of the expert player, and will leave the inexpert open to ridicule. The best style is usually distinguished by a quietness of demeanour only exceeded by the apparent want of action on the part of its possessor throughout the whole evolution which ends with the soling of the stone.

It is not difficult for the young player starting on correct

lines to acquire a good style of play, but it is otherwise with the player of mature years, and more especially if he have already acquired a style of his own.

The young beginner is most likely to possess a body already inured to feats of activity and strength by participation in other outdoor sports, and in any case he possesses that elasticity of body inseparable from average healthy youth. The beginner of maturer years, however, has probably for some time at least been leading a more or less sedentary life with its consequent stiffness of joints and flaccidity of muscle; or if he be already a curler, and has by exercise kept his body in "fit" condition, but at the same time desires to improve his style, he must in the first place eradicate what was faulty in it by perseverance in a better method.

Every player must decide for himself whether or not it is wise to attempt to change his acquired style, either wholly or in part. He alone knows the possibilities of his physique and the strength of his own will. The immediate result of any change from his usual style is not likely to be encouraging, and if he have not the resolution to persevere in the face of a temporary reduction in skill, until he has made the improved style his own, when only can he hope to reap the good result of the change, he would be better advised to retain that style of which perhaps he was a master.

It is one of the great drawbacks of the game that little, if any, time is afforded for practice as distinct from play, by the condition of our climate. So little time is granted to the curler even in the best of seasons, that each game played possesses all the characteristics of a match, in which the players on either side are bound in honour to consider the interest of their respective rinks, to the exclusion of all individual progress. In these circumstances there is little opportunity given to correct a fault in style, and none at all to practise a shot in which the player is weak.

In concluding these remarks on style, the beginner cannot be too strongly advised to obtain from the observation of some good player's method some idea of what constitutes a

good style of play as soon after he has been initiated into the society of "Brethren of the Broom" as possible. A few minutes spent on the grass by the side of the pond, with the stone to his hand, and that assistance which every true curler will be ready to extend to him, along with such information as we shall give in the following chapters of this work, will not only make the game in which he is going to play his part much more interesting, but will go far towards saving him from an experience of which it is truly and sadly said by those who have gone through it that ignorance must be bliss.

POSITION.

Having given a general idea of the principles of a good style in the particular game of which we are treating, we shall now deal with the chief constituent in it. This is the position of the player.

The player should try to assume, and what is of greater consequence retain, throughout the whole evolution of delivering the stone, the same relative position as between himself, the stone, and the latter's line of projection. In plain language, he should so poise his body that from the time he lifts the stone and until it leaves his hand on the way to its goal, he is not reminded of the presence of those members of the body, other than the eyes and the arm, which, however important the part they really play, should not obtrude themselves upon his notice. The implements of every game are but dead pieces of matter. It is the muscular and nervous power of the human body that endows them with life. But in speaking of any game, and when referring to those physical evolutions necessary to its playing, we regard its implements not as dead matter but as living factors in it. And thus the curling stone is really an extension of the arm and hand, and indissoluble from them, and throughout our remarks when we refer to the hand or arm we imply the attachment of the stone thereto.

If the player is conscious, in taking up his position, or

during the process of delivering the stone, that he possesses the average number of members of the human body, something is radically wrong with that position. This consciousness will naturally lead to the effort to place in an easy and comfortable position the troublesome member or members, and as this attempt will be made during the serious playing of the game, his skill is bound to deteriorate for the time being.

If, in the above case, the player is endowed with sufficient resolution to allow the more immediate results of his play to occupy a subsidiary place until he has rectified the error in position, well and good. Most players will, however, elect to suffer the discomfort in what they conceive to be the interests of their rink, and by familiarity become oblivious of it. But the error in position, it is needless to repeat, still remains though the adaptability of the body will, in time, render the player wholly unconscious of it.

The deduction then from what has been said upon the question of position is, that that position is best for each player which enables him to deliver the stone with the greatest ease, and therefore accuracy, to the farthest point which can be demanded by the necessities of the game. A greater or less degree of precision in play can only be maintained throughout a long day's participation in the game, by placing as little strain as possible upon any one member of the body, and the strain is least where no member, or part, of the body is overtaxed.

There are players who use the arm, and even the forearm, in the delivery of the stone to the exclusion of the body as a whole. In olden times when the weight of the stone was much greater, and its polish much inferior to those now in use, such a style of play was never seen upon the ice, for the simple reason that sufficient force to send the stone the requisite distance could not be obtained by any such partial use of the body. But now with the choice which the player has in regard to the weight of his stone, and the degree of perfection which the art of polishing has attained, many players, using the arm more or less exclusively, play a skilful game.

The beginner is almost certain to deliver his stone within the limits of that power which he can secure from the arm *per se.* It is easier to acquire a certain degree of proficiency by excluding as much of the body as possible from participation in the delivery of the stone than by embracing it as a whole in the act, but the degree of skill which can be so obtained will never carry a player into the first rank of curlers. We will illustrate this difference in style most effectively by a reference to the game of golf.

Two players, both in the same state of blissful ignorance, are on the tee and about to make their debut. The one, having teed his ball, in emulation of those players he has already seen play off, uses his club with like freedom, but alas, the certainty is wanting, and the ball remains *in statu quo.* Heedless of the laughter of his friend, and the half suppressed merriment of the onlookers, he smites again and again until he eventually succeeds in overcoming the inertia of the ball by at last striking it, and it goes — somewhere. The second player, profiting as he thinks by the bad method of his friend, ties his body, metaphorically speaking, into a series of knots, in which rigid condition he brings the club back until the head is in a line with his hips and literally pushes the ball in the direction he wishes it to go. There is no laughter, the ball has travelled in the right direction a distance of fifty or eighty yards, and he is satisfied, and probably proceeds to explain to his friend how easy the game of golf is if you only set the right way about it. He did not obtain the applause of the spectators, and would probably be surprised to the extent of expressed disbelief if informed that he never would be more deserving of it unless he changed his methods. And yet the fact remains. The first player has adopted a style which, with certain modifications that after-knowledge should supply, may carry him far towards eminence, but the other in his endeavour to escape a little good-natured ridicule at the outset of his career has adopted a style which, if persisted in, will exclude him from all probability of ultimate success in the game.

The player who uses his arm to the exclusion more or

less of the rest of his body, will require to be constantly on his guard. As a long day's play wears to a close, the strongest arm begins to feel the strain in the delivery of the stone. Unknown, probably, to the player himself, tired nature will call to her aid the momentum of the body to assist her in overcoming the inertia of the stone, and, as the position when playing from the arm is not identical with that otherwise used, the skill of the player is certain to deteriorate. The player will impute the falling off in his game to fatigue, and so it is indirectly. Had the arm not been tired it would not have called in the assistance afforded by the momentum of the body in a position where the latter could not freely act.

The majority of golfers find two rounds of the links enough for one day, and yet the chief exertion is that of walking—an exercise which everybody practises more or less every day in life—and the implements he uses are, so far as weight is concerned, mere toys. The curler, on the other hand, calls into use muscles which are seldom used to any extent during the rest of the year, and his implements compared with the weight of those the golfer uses, are as 100 to 1. A correct position, therefore, with its accompanying freedom and ease of play, are factors in the game, for the absence of which nothing can compensate the player. He may play well without these attributes to success, but he is certain to make the most of his powers where they are present.

With these remarks on position we leave the young player to find out that best adapted to his own particular case. Were we to attempt by diagrams to illustrate various good positions, we should be courting the influence of chance in deciding which should be adopted, and chance is an element which we do not desire to see playing any part in so important a question. To state how the right foot should be placed to the heel of the crampit, and at what angle; to lay down any distance within which the left foot should be placed when taking up position; and to dogmatise how far it may be advanced during the evolution of soling the stone;

or to assert that the position of the left foot should be such that its advancement is unnecessary, and many other details would but serve to propagate a cramped, where our desire is to inculcate a free, style in the delivery of the stone. The player is alone competent to decide these and other subtilities of position, and the less consideration he gives to them before his *debut* on the rink the better able will he be to realise their relative importance to his own case, otherwise he will be filling his mind with details which it cannot assimilate at that stage of his education. If he has seized the great underlying principle of a correct position, that it should be such as will allow the body to move and act as one piece of mechanism, the body itself will quickly decide in each individual case the correct solution of all details.

The crampit renders the player's foothold sure, but his equilibrium is maintained, with or without effort, according as his position is good or bad, and of two positions affording equal freedom in play, that is to be preferred which is least open to conscious or unconscious deviation.

THE SOLING OF THE STONE.

The player having ascertained that position which in his own case is best adapted to secure steadiness and the follow through of the body in perfect unison, should give his attention to the correct handling of the stone.

The sole of the stone is that part of its surface which comes in contact with the ice when it is laid down in the ordinary course of play. The slightest untrueness of this surface or inaccuracy of balance, whether arising from the stone itself, the handle, or the manner in which the latter is held, will react prejudicially upon the running of the stone.

The handle should be held as lightly as is consistent with the securing of full control over such a weight as that of the curling stone. The fingers and not the palm of the hand should be used, as by the former a delicacy of touch can be obtained beyond the reach of the latter. Any vice-like grip of the handle will react upon the equilibrium of

position, and produce unsteadiness and the tendency to pull the stone across the true line of projection.

The crampit, according to the rules of the game, must be placed six inches to the left of a straight line drawn from tee to tee. In the case of a left-hand player, its position is, of course, reversed. It may not be moved from this position, and the player must therefore sole his stone either on, or in close proximity to, this central line. Generally speaking, the nearer to the central line he soles his stone the more correct will his position be. The farther to the left of the central line he soles his stone, the greater is the tendency of the player to cramp his freedom of delivery; and the farther he goes to the right of this line, the more liable is he to break the true equipoise of his body by the natural tendency of the latter to fall over the stone. To prevent this result, a spontaneous tightening of the muscles will unconsciously take place, carrying with it the sacrifice of freedom in delivering the stone.

In "addressing" the stone—if we may be permitted to borrow a term from the links—there is no variation in any good style. The stone must not be lifted from the ice until the time comes when it has to be brought back preparatory to being sent forward to its goal. In the game of golf, the preliminary touching of the ground behind the ball, and the modified swinging of the club practised by good players, are the sure forerunners of an easy style. It is true that these actions are as invariably practised by bad or indifferent players, but here it is not the result of a free style of driving, but arises from an erroneous idea that these preliminaries are in themselves good style. They assume a virtue which they do not possess, but the refutation is, alas, not long delayed.

With the curling stone, however, no preliminary touching of the ice, or modified swinging of the stone must take place. The stone should rest quiescent upon the ice at that distance from the crampit from which it should invariably be played whatever the shot. It must not be lifted until the player is about to deliver the stone, and when the evolutions of raising

and the back and forward swing form one process, to be carried through without any conscious or observable break in continuity. The more perfect and simultaneously the whole sole of the stone is laid upon the ice, the more expert is the player in this part of the art of the game, and the better can the varying strengths necessary in different shots be judged.

Too great deliberation in play on the one hand, or a hurried delivery of the stone on the other, are both characteristics of a player likely to be easily put off his game by adverse circumstances. There is a certain psychological moment at which the stone should be delivered. The tendency of the too deliberate player is to let this moment pass, and of the quick player to forestall its arrival.

There is a certain reach within which a player should sole his stone, but the correct point varies with the individual. It is governed by the height of the player, his length of arm, the distance which the left foot is advanced in play, if it be advanced, and according as the right foot is kept stationary or carried forward along with the general movement of the body.

In the case of a beginner chipping the ice with the "nose" of the stone, a fault not alone confined to those who are serving a novitiate to the game, this need not arise, as is so generally assumed, from any error in the mere handling of the stone. Chipping the ice is much more frequently the result of the player soling his stone at a point within his correct reach. He may be soling his stone at a point which, were he playing with the arm to the exclusion of the body as a whole, might not unlikely be the correct place, and that this fault is not more common, or even universal, with all young players is due to the fact that these invariably begin to play with the arm only. When chipping the ice does occur with a player who is not a novice it is usually after the game has been in progress some time, or where the ice is dull or bad. In both cases the fault arises from the unconscious dragging in of the body to the assistance of the arm to enable the latter to accomplish what of itself it is

unable to perform. As we have already said, the two styles of play are distinct, and they cannot be combined at a moment's notice, even consciously, with success.

As chipping the ice with his stone is in many cases the result of a player soling his stone too much within his true reach, so is throwing the stone upon the ice invariably the result of going beyond this point and overreaching. The correct point at which to sole the stone is just before the swing begins to carry it in an *upward*, as distinct from a *horizontal*, direction. If the stone be soled before it is being carried along the horizontal plain, chipping must result, but if the hold upon the stone is retained until the swing is carrying it upward in the smallest degree, the stone cannot be truly soled unless the continuity of motion is broken, which is fatal to the shot. The longer the hold upon the stone is retained after the horizontal line is left, the farther is the stone being carried from the point of contact with the ice, and when the hold upon the stone is removed the latter meets the ice with a delivery which partakes more or less of the characteristics of a throw. If the hold upon the stone be sufficiently prolonged its somersaulting will result.

Where there is any difficulty in getting the stone up, either from its weight, want of polish, the condition of the ice, or a combination of these circumstances, the intelligent player will soon see that by overreaching, and therefore rocking the stone, he can in many cases overcome the difficulty. Assuming that he can guard against such excess in the overreach as will produce the overturning of the stone, the heel of the sole will first come in contact with the ice, and the motion communicated to the stone will be a rocking one. Until this rocking motion ceases, and the stone proceeds upon its course resting upon the whole circumference of the sole, but a fraction of this circumference is in contact with the ice at the same time; and as, *cæteris paribus*, the smaller the surface of the stone in contact with the ice the farther it will travel, the improved running of the stone when a rocking motion is communicated to it is explained. This rocking of the stone, however timeously it may serve a

player, is yet a dangerous expedient. It is quickly acquired, but not so easily discarded when the necessity for it has ceased. As the player has no lien over the condition of the ice, his wisest course is to procure lighter or better polished stones. If a player cannot send his stones the requisite distance by the exercise of full drawing strength, it is better to bow to the inevitable than, by cultivating a dangerous habit, run the risk of a general deterioration in his subsequent play under normal conditions of ice.

The running power given to the stone in so far as communicated by the player depends less upon strength *pur et semple* than upon the way the energy is applied and the soling of the stone. The exercise of a degree of strength approaching brute force is fatal to fine play. It is not necessarily the strong man who, by the aid of that superabundant strength with which nature has endowed him, can send the curling stone hard and in true line along the ice, but the strong player—a very different thing.

THE HANDLE OR TWIST—ITS EFFECT UPON THE COURSE OF THE STONE.

" But whenever a stone, in leaving the hand, is made to revolve upon its own axis, on keen ice, it will not move in a straight line to the mark, but will proceed in a curve, deflecting to the right hand, or the left, according to the twist which has been communicated to it when set down. If the elbow is turned out in playing, the outside or natural twist takes place ; and if the elbow is turned in, the inside twist is the result. There are few players who can avoid twisting their stone ; and this almost universal fault is the great cause of the ill-success which attends their play. It is a fault, moreover, of the effects of which inexperienced curlers are generally unconscious ; and I have seen large parties of curlers twirling their stones to the left hand, and complaining, with one voice, of the heavy bias on the ice, when the ice was perfectly level, and the disappointment of the players

was to be ascribed solely to the rotatory motion of their stones. To guard against the habit of twisting is the first lesson to be learned by the young aspirant; and he who has learned to play a straight stone has already overcome one of the greatest difficulties of the art, for in ordinary circumstances this is the style of play which will tell most on the success of the game."

With all deference to the writer of the above-quoted paragraph, we differ from him when he says, that a stone which is revolving on its own axis, at the time of leaving the hand, will not go in a straight line, but in a curve. Were the stone in such a case to take the course ascribed to it by this writer the width of the average curling rink would require to be doubled, if not trebled. Fifteen feet is the average width of the artificial rink, but as this is divided by the tee being placed in the centre, the stone in describing such a curve as that above-mentioned will require to work within a radius of seven feet and a-half.

We will assume, for the sake of illustration, that the player has to draw to the tee with the out-turn, a distance of 42 yards. Now, according to the above writer, the stone proceeds to describe a curve, from the point whereon the stone is soled to the tee. It is beyond the skill of the most expert curler who ever soled a stone to describe with it the segment of a circle 126 feet in length, no part of which shall have a greater radius than seven feet from a straight line drawn from tee to tee. Even were it possible to describe such a curve, with the unbiassed curling stone there is no degree of skill which could calculate the line of projection necessary to bring this curve to a given point as in the case of a drawing shot.

On an unbiassed piece of ice, the perfectly balanced and polished stone, truly soled, should run in a straight line from the point at which it is set down until the energy used in its projection is spent and it stops, *so long as this energy is wholly used in the forward motion of the stone.* That is to say, that the stone in addition to travelling forward must not at the same time be revolving on its own axis. But

these perfect conditions are rarely secured for the playing of the game, and we may therefore dismiss the probable course the stone would pursue in them from our consideration. The question is in the same category as that concerning the course of a rifle bullet fired into a vacuum. In neither case is the question likely to be scientifically proved, because of the difficulty of realising the conditions for the experiment.

In the average conditions under which the game is played, the possibility of delivering a stone so that at no time during its course along the ice it shall revolve upon its own axis is very doubtful ; and fortunately for the game a straight shot may be played where such revolution has taken place.

In the course of all shots possessing a dual motion—that of the line of projection of the stone and that of the rotatory motion upon its axis—these motions cannot act upon the stone *at one and the same time.* If they could do so, it might be possible to secure that curve of which the above writer has dreamed. In delivering the shot, the energy communicated to the stone in the line of projection is much greater than that given to the rotatory motion on the axis. But in addition to the velocity of the stone being lessened as the stone travels onward in the line of projection, because of the using up of the energy originally communicated, there is also being abstracted from this energy sufficient force to keep the stone revolving on its axis, as may be seen by the stone continuing to revolve after all forward motion has ceased. At some moment in its course the motion of projection becomes subservient to that of rotation, and it is then that the stone begins to curl according as its rotatory motion is inward or outward.

It is usually many seasons, and many players go through the greater part of their careers before realising the extent of the curl which may reasonably be expected of the curling stone under normal conditions of ice. The result of the twist communicated should be looked for in inches, and not in feet or yards. Although the stone curls primarily

because of its rotatory motion, a certain forward impetus must be present as well ; and as the revolution of the stone on its axis only begins to affect its course when the forward impetus is nearly spent, the period within which the curl may take place is very limited.

In addition to being able to play a straight shot, that is one in which the rotation of the stone upon its axis is absent, or, as we think much more probable, one in which it is never at any period of the course of the stone stronger than the forward impetus communicated, the player should be able to give the in or out twist to the stone. To be unable to play either is to handicap himself severely in the correct playing of many shots in the game. In the case of his relying more or less entirely upon his capacity to communicate one of these twists, where it happens that the bias on the ice is in favour of the action of the sole twist at his command, he will be unable to counteract this bias by the use of the other. The line of his shot will then have to be calculated more or less upon the curve principle enunciated by the old writer quoted in the opening paragraph of this chapter.

The handle of the curling stone has no effect upon the course of the stone. The phrase sometimes heard upon the ice, to the effect that " the handle will bring it," means that the rotatory motion of the stone upon its axis is in that direction from which a serviceable curl may be hoped. The handle is there for the purposes of lifting the stone, of communicating the desired twist, and also to shew the direction of this twist.

The twist may be communicated to the stone either by the wrist turning the hand as a whole, or by the little or forefinger according as the in, or out, turn is desired. The latter is the method adopted by many of the best of the older school of curlers.

THE SHOT AND ITS VARYING STRENGTHS.

Having treated of the position of the player and the delivery of the stone—separate entities conjointly constituting what is understood by the term "style"—and also of the effect of twist as communicated to the stone, we naturally come to a consideration of these as one evolution resulting in the shot.

To keep the eye fixed upon the desired point of the shot is an axiom of the game. The young player entering the game with his mind full of the many details of position, &c., which have not yet become homologated, as they ultimately will, into one automatic evolution, is almost certain to omit, or but cursorily perform, this *sine qua non* of success in the game. But even the cursory glance will not do! The eyes must be glued to the mark throughout the whole evolution which ends with the soling of the stone. If the eyes are on the mark only when the stone is soled, the player may have looked at it "with all his e'en," but he must remember that the stone is not soled by the eyes. These are but the wires along which information is conveyed to the brain to enable the latter to intelligently control the action of the body.

Though the eyes must not be removed from the mark until the stone has been soled, the player who attempts to literally carry out this process will not improbably find that he has removed his eyes from it just that fraction of an instant too soon which makes all the difference in the result of the shot. It is impossible to keep the eyes too long affixed to the mark—it is very easy to take them away from it too soon! Guard, then, against the latter fault by using the latitude afforded to err on the safe side, even though by doing so you may be exercising an unnecessary degree of caution in making assurance doubly sure.

There are some players whose practice it is to take an intermediate mark in line with the point aimed at, and on

which they play. There are many objections to this method of getting the line of play. This intermediate point has position but no superficies. It exists only in the player's eye: whereas the real point of the shot is either marked by another stone or may be given by the besom of the skip.

The practice of looking at an intermediate mark is not one to be cultivated. It can seldom, if ever, be necessary on the ground of deficient eyesight, for the player who cannot see a stone forty yards from him. with or without artificial aid, is hardly conceivable. In addition, however, to the objection to such a method for obtaining the line of projection of the stone, it must also have a very prejudicial effect upon the player's judgment of the strength with which the shot should be played. With an intermediate mark, in a drawing shot, the stone is very liable to be short. In playing to such a mark, if it is to be made the most of, the mind must be concentrated upon it, and if the player bears in mind, as he should, the important fact that the stone has to reach a point fifteen or twenty yards beyond, he will require to play something approaching full strength on the intermediate mark in order to reach the terminal point of the shot. Thus arises a complicated method of attaining a simple end.

Until the improvement took place in the manufacture of the curling stone, bringing the acquisition of skill within the reach of the physical powers of all players, the game was one in which physical strength played the most important part. Tradition has it that the curling stone has been made to travel one mile, laid down in the ordinary way of play. It is, moreover, on record that it was not uncommon for players of yore to send the stones across the Kirk Loch, in Dumfriesshire, from a place then known as the Orchard, to another called the Skelbyland, a distance not much less than a mile. Upon one occasion the strongest player on one side, annoyed at the adverse result of the match, challenged any of the opposite party to a trial of strength. With that one of the latter took his stone, and sent it with such force that it not only crossed the Mill Loch, but met the bank with such force that it jumped on to the grass and rolled a consi-

derable way. "Now," said this champion, "go and send it back and we'll believe you're too many for us." Fortunately for the game, its evolution has ceased to give any advantage to the possessor of unusual strength, even though such is conjoined to skill.

Nine-tenths of the results which prove the skill of the player must be secured by the use of what is termed "drawing strength." Drawing strength may be defined as *the use of sufficient force to enable the stone to reach a given point where it comes to rest because of the original energy communicated to it becoming spent.*

Such a shot is by far the most difficult to negotiate, because, whilst every seen obstruction must be avoided, those unseen and no less fatal to success, such as bias or roughness of ice tending towards this, must also be overcome. If the strength is weak, the shot may guard an opponent's stone, or if too strong, may take a counting shot of his own side out of the "house," and between these extremes there are varying degrees of harm which may result.

A drawing shot which does not reach the desired point, or within a certain radius of it, is not merely wasted, but if laid down in true line will prevent any succeeding player of the same side successfully attempting the same shot, unless the objectionable stone has been first removed from its position. A stone so played may, under certain circumstances, render necessary an entire change of tactics on the part of a skip to his own disadvantage.

On the other hand, a shot played with too much force, even though a counting shot of the same side be struck out of the "house" by it, is yet of use. It leaves the game in precisely the same position as before the shot was played if the stone met be struck anything like fair, and though it gives the opposite side an opening which they should not have had, it does not necessarily follow that the line of play decided upon by the skip must be altered.

In all cases, therefore, it is better to be too strong than not to reach the point to which the shot had to be drawn. The former fault frequently carries with it the seal of confi-

dence, the latter that of timidity ; and in the game of curling, where a degree of skill which will enable a player to draw to an inch should never be expected, and, therefore, never calculated upon, the shot played with too much strength, may succeed from unforeseen circumstances, where that which is weak must, of necessity, fail.

A shot laid down with twist—*i.e.*, one wherein the stone is made to revolve upon its own axis—will not travel as far as the shot wherein this twist is absent, given that the same original force be communicated in both cases. In the case of the stone delivered with twist, the energy communicated is being utilised in two ways—in the revolution of the stone on its axis and also in the line of projection—and is consequently sooner spent. In the case of the stone without twist, this energy is used in a single way—in the line of projection.

The fewer revolutions, therefore, the stone makes upon its axis, the easier is it to judge the requisite strength necessary for the shot. A stone which on being soled proceeds to revolve quickly on its axis is seldom of much use. Conscious effort in such a case must have entered into the operation of giving the desired twist, instead of this being the result of an automatic movement. Very little movement of the wrist is necessary to secure the revolution of the stone on its axis, anything beyond this is superfluous where it is not prejudicial to skill.

The more circumscribed the area to which the shot has to be drawn the more difficult the shot, unless in the case where another stone affords a rest. The strength to be used in playing a drawing shot varies between that for the longest possible guard—where the stone must just clear the hog score—and that for a stone lying with its inner edge touching the farthest point of the 7-foot circle. To any point within this distance the player may require to draw ; and though he may not be able to command accuracy, he can at least make sure of " being up " and giving such skill as he possesses every chance.

In the game of curling, unlike that of golf, no calculation

of distance is ever necessary. The player knows that in a full-length rink the distance from the crampit to the hog score is 35 yards, and this the stone must cover before it comes into play. From the hog score to the 7-foot circle, where the stone begins to count, is 14 feet, 7 feet beyond this is the tee, and a like distance past the tee will carry the stone through the " house," when it ceases to count in the game.

The distance a stone has to travel can be almost as exactly ascertained as if the lineal measure had been used in the operation, but to re-measure this distance with the stone, requires the finest touch and the nicest appreciation of strength, and is the very apex of the art of the game. It is one of the characteristics of a drawing shot that the nearer it is to success without reaching it, the worse is the dilemma in which the player's side is frequently left. But the young curler must not let this fact weigh with him, or it will hinder his progress in the art of the game. He must play every shot with the best skill at his command, and he cannot do this if he soles his stone with fear and trembling as to the result. He can but do his best in any shot he is asked to play, and the consequences of failure must be left to the consideration of the skip.

There is a tendency amongst all players, mature as well as inexperienced, to follow up a shot which has failed through weakness by one which errs from being too strong. The fault, however, is one on the right side, but as in most of the affairs of life so here also, there is a *via media* which approaches perfection.

In the game a direction is frequently given to a player to take his " will " of another stone. This is usually followed by the player sending his stone along the ice in emulation of the curler of old, whose intent was to send his stone the best part of a mile. By the player of experience the command will be taken *cum grano salis*, and modified accordingly ; but by the beginner it is only too likely to be literally obeyed.

In playing on to a stone, so as to remove it from the

"house," the distance the stone so struck travels, or might travel, beyond this circle is not merely of no importance in the shot, but the superfluous energy used is calculated to have a prejudicial effect upon the result of the shot.

In playing a shot by the use of what we will term full drawing strength, in order to avoid infinitesimal distinctions, incapable of being reduced to practice, and meaning by the term the exercise of sufficient strength in propelling the stone as will just suffice to remove without the "house" any stone struck, no attention should be paid to any existing bias on the ice. This description of shot should reach the stone, the removal of which is desired, without such reduction in its velocity as will allow bias, and still less twist, to affect its line of projection. It is the easiest shot in the game to bring off consistently, and yet it is one which, by many players, is regarded as the whole art of the game. The applause, or at least satisfaction, when an opponent's stone is made to "walk" is always certain, whereas the consistent drawing to the 4-foot circle of the first player may pass unnoticed until he sends down a stone which is wide, when perhaps he is informed that he is not playing up to form.

The satisfaction derived by many players from the fact of an opponent's stone being removed from the "house" with double or treble the force necessary to obtain the best result from such a shot is difficult to explain. Possibly the explanation may be found in that quality of the human mind which induces the small boy to kick the discarded meat-tin about the street to the certain injury of his boots, and frequently of his toes, for no conceivable purpose other than that satisfaction presumably contained within the action of kicking something, or, rather, anything.

A full rink consists of four players a side. In friendly games between members of the same club necessity sometimes reduces this number, and at other times increases it, but games so played are never satisfactory and to be avoided, even although such a course entails the standing-out temporarily of certain members of the club.

The respective positions in a full rink are designed as

first, second, and third stones, and skip. The latter most frequently plays the last stones for his side, but he has the option of playing in any position he desires.

In the event of a player having any option as to the particular rink in which he is to become a recognised player, he will be well advised if he elects to play in a rink, the individual members of which are not greatly his own superiors in skill. His chances of promotion therein are greater. He will be asked to take shots which in a rink of skilled players might but seldom come his way in the position of first, or more probably second, stone; and in a rink where the successfully brought-off *curling* shots are in a minority of those attempted, he will have more latitude for the exercise of his own judgment as to the line and twist to take and apply. The onus of failure in such a rink not being altogether unknown, the confidence with which he attempts the shot will not be shaken by trepidation at the possibility of his non-success.

It is no doubt satisfactory to secure a place in a winning rink at matches and bonspiels, and infinitely more depends upon the first and second players than they are ever likely to receive credit for. The majority of their shots must be negotiated with drawing strength, and they it is who make the game for their rink. Though the shots which fall to the lot of the first and second players are easier than those frequently asked of the third stone and the skip, where he plays last, yet it is undoubtedly true that the success or failure of the former players as a rule means more than that of the latter.

Generally speaking, a skip places the player in whom he has least confidence in the second position in the rink, but let not such a player be disheartened by any such invidious distinction. In a well constituted rink there should be no weak place, and it rests with the player himself to turn that position which was regarded as weak into one of impregnability.

THE SKIP.

It is far too generally assumed that in order to competently skip a rink, the player must have grown old in the practice and experience of the game. Nor is this assumption of age, as the *sine qua non* of knowledge and experience, confined to the game of curling, but enters largely into most of the affairs of life. When Wolfe was made a general at the age of 32, and sent to accomplish the herculean task of driving the French from Canadian soil, those ancient prophets who had never done anything for the greatness of the empire, but contract gout and grow hoary in her service, shook their wise heads and gave utterance to the delphic imbecility—"far too young."

There are certain of the affairs of life, the details of which are so many and various, that even a fair experience carries with it the necessity of mature years. Such a position is that of Foreign Secretary to the Empire. No two international questions are likely to be the same. They are almost certain to differ in details of the first magnitude, and each has to be dealt with on its own merits and at once. The diplomatist's library is the experience of his predecessors, but this, whilst affording a faint line of guidance, seldom produces a precedent.

In the game of which we are treating, however, and more especially in that branch of it relating to the direction of a rink, the basis of competency rests upon certain fundamental principles, which the player of thirty years of age is as well able to seize and modify as the player of three score years. And knowledge of, as distinct from the mere number of years given to, the game being equal, the youthful skip possesses some advantages over his older brother.

Let the young player who gives his time and thought to the game put away from him the stultifying dogma that youth must be rash. There is no more common saying than that you cannot put "an old head on young shoulders!"

With infinitely more reason might it be said that you cannot put a "young body to an old head." It must not be forgotten that, unlike that high position which we before took to illustrate our meaning, the position of skip, over and above the mere direction of the rink, calls for the exercise of the greatest skill, and that, too, at the most crucial stage of the end. He cannot, as in certain other positions in life, employ others to carry out his ideas, and do what we will we cannot get away from the recognition and acceptance of the fact that, after a certain period of life, though we may continue to gain in experience, we begin to lose in the power of execution.

We do not desire, by decapitation or otherwise, to produce such an attrocity as the old head on young shoulders. We want the young head with its intelligence clear and unfettered by tradition, and the young body with its physical powers at the zenith! That combination realising the old classic adage, *mens sana in corpore sano.*

The first absolutely essential quality in the personnel of a good skip is that he should have his temper under perfect control. Not only that it should not find expression against the offending player, but that it should not find a resting place within his own mind, or the probability is that any such feeling will prejudicially affect his own game. There is no palliation under any circumstances for bad temper! A quick temper, on the other hand, is more often than not the shell which encloses a kindly heart, and its possessor is but ill-adapted for a position in which he is certain to have many opportunities for its display. I have never seen a game played wherein every member did not do his utmost as far as his skill would allow him; and where a player does his best, he has a right to demand that his efforts do not meet with expressed disapproval, and to expect that the credit of having done his best shall not be withheld from him.

There is no other game in which the motto of the chivalric musketeers of Alexandre Dumas holds so true. "One for all, and all for one," contains the alpha and omega of

the true spirit of the game. There is no such thing as one member of a rink playing for his own hand, and it has always appeared to us an anomaly, that the name of the skip should be engraven upon that trophy in the winning of which his three brethren of the broom must have had collectively the greater share. In a game of cricket one player may win the match off his own bat, however poor the display of his fellows, but in curling such a feat is beyond probability, if not conception.

It is the custom of some skips when they have vacated their position *pro tempore* to follow up to the "house" the stone they have played in order to ascertain the result. Some even go the length of waiting there until their opponent has played to see the result of that shot also. This habit cannot be too strongly condemned. The skip has the choice of any of the four positions in the rink, but having made his selection, when it is his turn to play, the direction of the rink rests with the player he has deputed to succeed him. The position of this deputy may be made a sinecure, because though nominally in charge of the rink, the skip is not bound to give effect to any deduction his substitute may make. He may obtain such information as to the position of the stones as he desires, and draw and act upon his own conclusions. But the wisdom of making the position of his substitute a mere exchange for the conveyance of information is open to question. A day may come at any time, and must eventually come, when he cannot be present to command his rink, and then will the result of such conduct be made apparent.

The aim of the true sportsman is to so use the individual skill of the players forming his rink that the aggregate may win by playing a finer game than that of his opponents. Unfortunately in the game the aim of the respective sides is, too often, restricted solely to winning. To the player incapable of grasping the finer points of the game, the mere winning of it will afford all the satisfaction possible to him, but this falls far short of that obtained from winning the game by the exercise of finer skill.

What, then, it may be asked, constitutes a fine game; One wherein an opponent's stone, if it cannot be used is never abused? It is not difficult to conceive a game where the first stone of the respective sides are lying on either side of the tee, and the stones of the succeeding players kept throughout the game on that side of the rink on which the leading stone lay. As no player will deliberately abuse the stone of his own side, the end would be won by that side which shewed the greater skill. Such conditions as these are, however, never likely to be present in the actual game in their entirety, but you will occasionally meet a skip of as true sporting instincts as yourself, and who will keep these conditions as far as he can, with due regard to the rules of the game and the interests of his own side. Where, however, a skip is met whose conception of the game is, that a good stone laid against him must be abused the best game to play is his own. It is unfortunate that in the game the easiest shot, that known as "taking your will of" any stone is also that which will, if consistently convenient, make a fine game by the other side impossible. All that can be done where this "chap and lie" game is played is to follow suit until the time comes—and come it will, and frequently—when an opportunity occurs of getting in a real curling shot which will be beyond the reach of such a skip and his satellites.

It is by considering what will be left after a given shot is played that the skilful skip simplifies his game, and has perchance to endure in silence the anathemas uttered by his less skilled opponent on the way what he is pleased to term "the luck" is going. Luck exists in all games of skill, but the less the skill the more will luck preponderate, and it is this which makes it the disheartening element it is to the more or less skilled player. You cannot guard against it. So far as you can see you have left your opponents nothing but a drawing shot with the narrowest of ports to negotiate, but up comes the stone intended to reach a point where you had made "all safe," but in reality laid down to reach a point perhaps two feet off the intended line. You wait until the

commotion caused by its hurried arrival has ceased, and then, lo! the scene has changed! Your well-devised and skilfully played end has vanished, and your opponents lie shot. But bear what the golfer would term "a rub on the green" with equanimity, and continue to play the game. Luck favours the unskilled, not only because of his want of skill, as we before said, but also because in a rink composed of more or less unskilled players his own side will probably have left him little or nothing which he could "make a mess of." Where such, however, is not the case, the chances are equal, whether the result of the shot is for or against you. In the average game, however, anything but the most extraordinary run of luck should not win. The lucky shot is not always the last one played, and where it is otherwise it may frequently be utilised to your own advantage.

In directing your players, never give a difficult shot where there is an easier, which will serve your purpose "nearly as well;" and let the standard from which you judge their capacity be their average play. The more you can keep what is asked of them within their average capacity, the more likely are they to bring off successfully, when the exigencies of the game peremptorily demand it, a shot beyond it. You are, too, not only using their capacities to the utmost, consistent with the winning of the game, but are at the same time giving them that steadiness and confidence which a few misses at different shots is the surest way to undermine.

There is nothing in the game of curling at all synonymous with what is understood as "a bad stroke" at cricket, and there is no shot in the game which can *ipso facto* be termed a "bad shot." It is the intention which makes a shot good or bad, and a succession of fine shots need not, by any means, constitute a "fine game."

Unless where there is a rest against another stone, a player should never be asked to "draw" so finely that his failure to reach, or over-drawing the given point by inches, should constitute a danger to his side. The conditions of the game are such that, except where a rest exists, infini-

tesimal measurements should be excluded from the calculation of the skip, and to give the player the latitude of being there or thereabouts is one of the fundamental principles of his art.

When nearing the end of a game, and with the marker in his favour, the skip should be doubly cautious. The nearer the scores approximate, and therefore the greater the chance his opponents have of wining, the less likely are they to take any risks, and the game will be played to a finish on true lines. If, however, the lead is so great that the ends or time remaining hold out no probability of making up the leeway by superior play, the back marker, having nothing to lose and much to gain, will "force" the game. It is then that the steadiness you have cultivated in your rink will befriend you. Keep yourself so well in hand that the immediate success of your opponent's change of tactics, a result which very often occurs, does not induce you to change your own. If you do the odds against you are more than doubled. Go on playing your own game, and never hesitate at such a stage of it to run a little risk, the degree varies according to the circumstances, if by doing so you can snatch another shot.

Where the game is one of so many shots, you must get the requisite number to win, and nothing is so calculated to unsettle your opponents as your continuing to get a good share to add on the lead you already possess. Where the game is one of ends, and to halve or "peel" such is very rare, your best defence is to secure your fair proportion, and as much more as you can.

We have not attempted by diagrams or otherwise to initiate the youthful skip into the mysteries of the art. Such might be multiplied indefinitely, and would after all be but "book games." We have contented ourselves with the endeavour to give him some idea of the principles of the art upon which foundation his experience upon the ice may safely build; so that as the curling seasons go past, each may add to his knowledge by the positive process of addition and not by the negative one of subtracting what he once

believed to be good, but which experience has proved to be unsound.

The characteristics of the skip react upon the players. They not only take their directions from him, but as they see their skip cool and determined, under the most adverse proof of the marker as to how the game is going, or flurried and vacillating, will they play their best, or otherwise.

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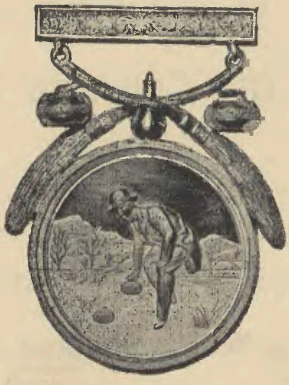

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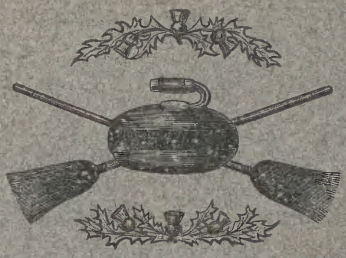

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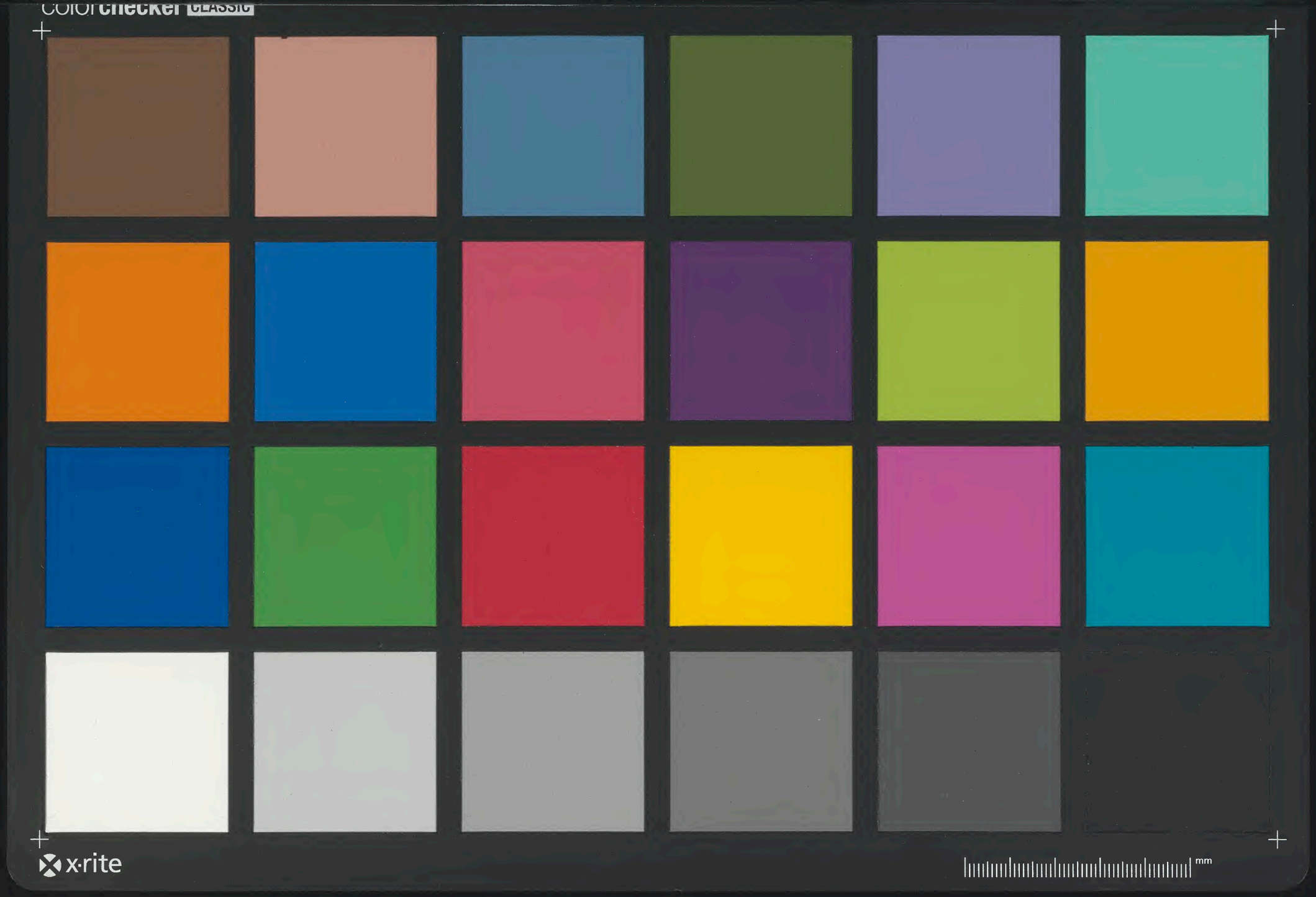
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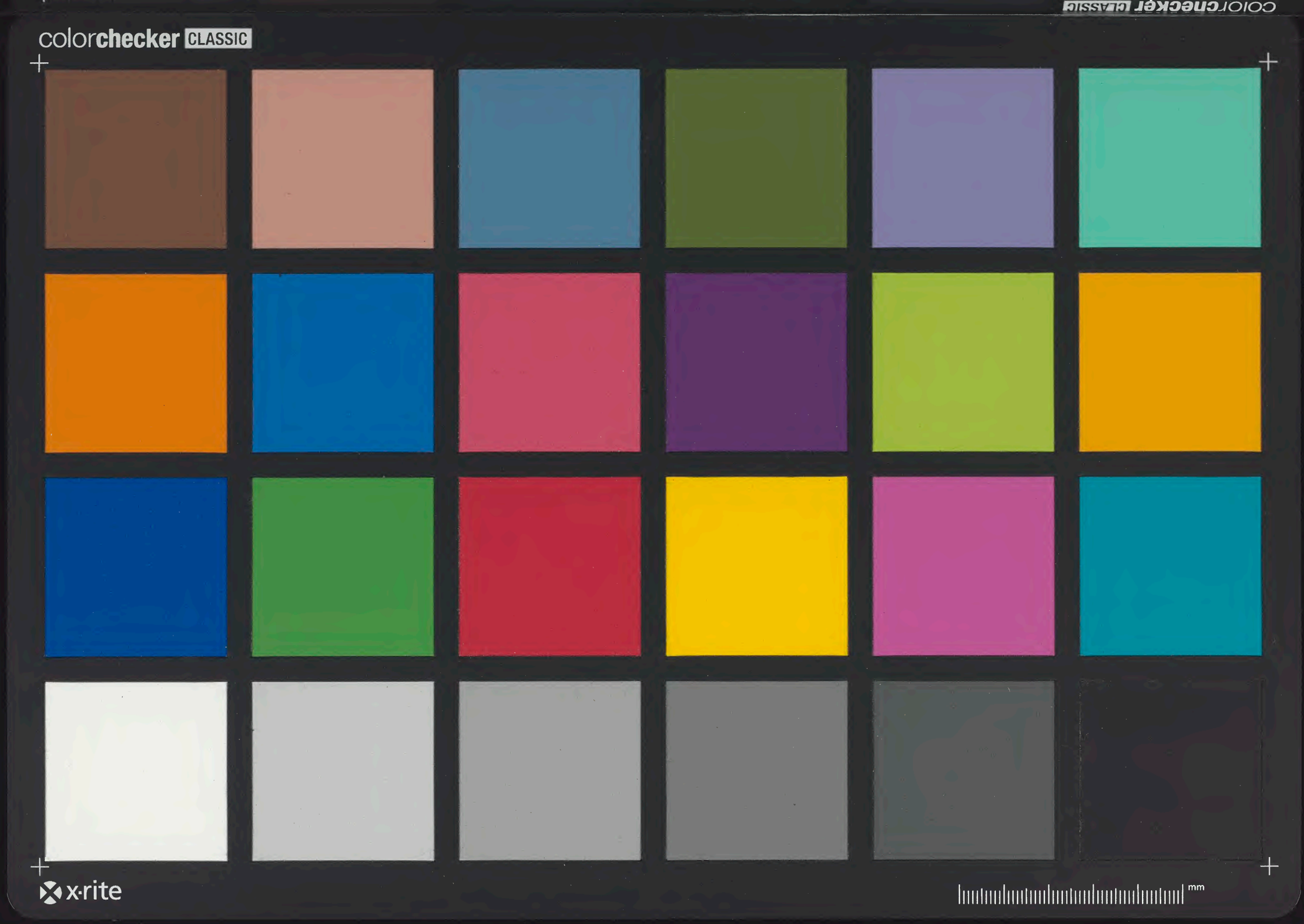
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