

between those people that erected the extensive earth-works of the Ohio valley and elsewhere, and the 'wild tribes' of the Atlantic seaboard, is practically nothing. I still hope to find unmistakable artificial mounds in New Jersey; basing my expectation upon the fact, that natural hillocks or knolls were frequently used as places of burial, and were chosen as desirable sites for the erection of wigwams.

CHARLES C. ABBOTT, M.D.

THE IGLOO OF THE INNUIT.¹—III.

THE only instrument used in the construction of the igloo is the snow-knife. Where the Innuits have intercourse with white men, they bar-



MODERN SNOW-KNIFE.

ter for cheese-knives or long-bladed butcher-knives, remove the double handle from the tang, and put on a single one about three times as long, which can be readily grasped by both hands. The old knives were made of reindeer-horn or from the shin-bone of the reindeer.



SNOW-KNIFE OF BONE.

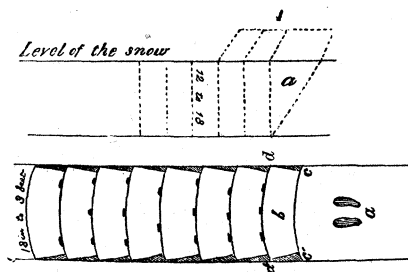
Among the Esquimaux in and around King William's Land I found snow-knives made of copper stripped from Sir John Franklin's ships, the imprints of the queen's broad arrow still showing on many, the blades double-edged or dagger-shape, and the handles of musk-ox and reindeer horn rudely attached by sinew lashings.

The snow-knife of iron, while more convenient in many ways, is far more liable to break in the intense cold of the winter weather, such accidents with them being very common. I have seen igloos built when the thermometer registered -70° F. At such temperatures the snow becomes almost stone-like in its compactness. The snow-knife is often used as a substitute for the snow-tester whenever that instrument is broken or left behind, for the Esquimaux are a very careless and absent-minded people.

Before starting to cut the snow-blocks, the builder gets from the sledge a pair of gauntlets used for this purpose, only being of finer and softer reindeer-fur, so as to give the hands the most complete freedom of motion. These

gloves extend half way up the fore-arm, and have a puckering-string around the top, which the builder's wife pulls tight, and ties so as to completely exclude the snow while he is at work in it.

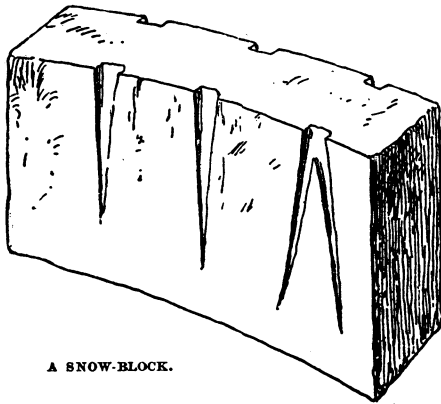
The igloo is built on the sloping drift of snow, the entrance being at the lowest point. The first trench from which the snow-blocks are cut is so disposed as to have its axis coincident with the diameter of the igloo, which runs directly up and down hill, or which makes the greatest angle with the horizontal. These snow-blocks are from a foot to a foot and a half wide, from a foot and a half to two or three feet long, and eight or ten inches thick. The first block cut from the trench is a thick triangular one, which is thrown away (see *a*, which is a vertical section through the axis of the trench). A ground plan of the blocks would show that they are partially curved, but in no manner to such an extent as would be needed to conform to the curvature of the igloo. This curvature is the result of their manner of cutting by a swinging motion of the whole body, held almost rigid, and rotating about the foot steps, *a*, in the figure. This motion of the whole body gives them considerable power; and the resulting curved blocks, if large, are in the best shape for the first part of the structure. In cutting the block *b*, first the right-hand edge, *cd*, is cut by three or four powerful downward strokes of the knife, and then the opposite edge, *c'd'*. The knife, with its blade held horizontally, is passed under the block in front of the toes of the builder's feet. About three or four inches in depth of the line *d'd* is cut; and,



with the knife in the right hand, two or three deep vertical thrusts are made along this line, which generally separate the snow-block from its bed, and it is caught with the left hand as it falls forward. I have tried to represent these gashes in the figure. They are plainly visible on the snow-block inside and out, and a good artist would represent them in his pictures of the huts. The blocks are carefully lifted out and placed beside the trench, as, under some circum-

¹ Continued from No. 29.

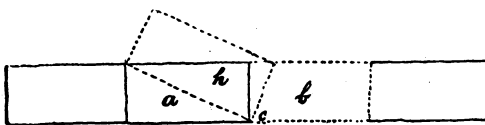
stances, they are extremely liable to break in handling. If the snow has been properly tested,



A SNOW-BLOCK.

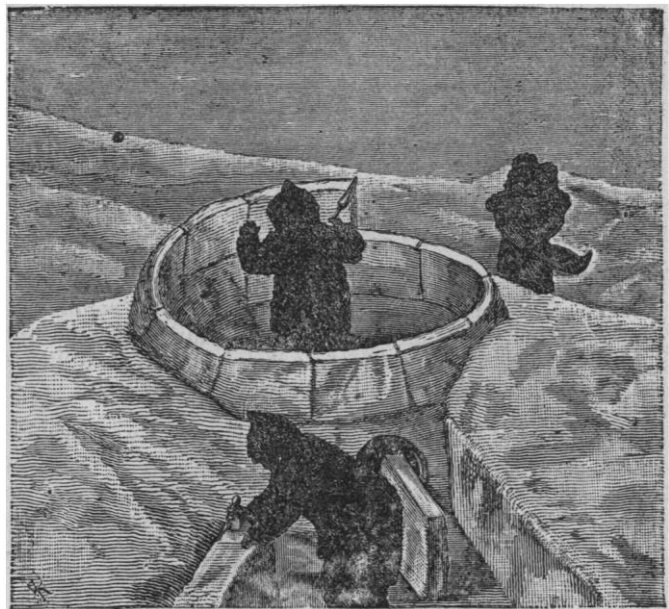
this should, however, seldom occur. The trench completed, and enough blocks secured to form the first or base course, the floor is laid out by a circular sweep of the knife, varying in diameter of course, according to the number of intended occupants. Commencing at the left hand, this course is laid until the first block, *a*, is reached, which is cut in halves from its first lower corner, *c*, along the ascending diagonal; and the top half, *h*, is thrown away. The last block, *b*, has its contiguous corner cut off; so that the next block, shown in broken outline, ascends and forms the first block of the next course. The igloo is then formed of this spiral of snow-blocks, each course inclining inward slightly more than the one previous, until the last, which may be called the key-block, is perfectly horizontal, and firmly wedges in and binds the whole structure. This spiral form of the courses I have tried to show in the illustration of one of the half-completed igloos.

I know that the general idea is, that each course is complete within itself, like a course



of bricks on a round tower in our method of building; but a moment's thought would show

this to be almost impossible, as the first block in the course, after they had commenced to lean considerably, would have to be supported until it was flanked by others; and these, again, would be very unstable. In fact, one often wonders how a snow-block will hold in place against its own weight, leaning far inwards, almost horizontal, and supported only on two sides, and will imagine that the native workmanship must be very good to give such results. As the blocks approach the top,—where they are more nearly horizontal and more liable to tumble down,—their figure becomes trapezoidal in order to keep the vertical joints pointing to the centre and top; and, while supported on but two sides, these form a more or less acute angle,—more acute as it is needed and approaches the top, where the last few blocks are made triangular and meet at a point. The workman stands inside until it is completed. Despite all the care, the falling of



THE HALF-BUILT IGLOO.

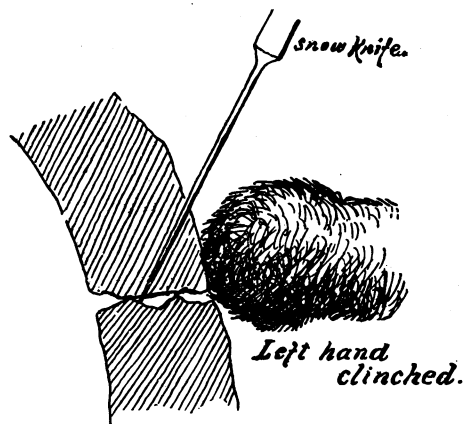
blocks is a very common occurrence, and happens with nearly every building.

It will be remembered that the base course has been laid upon a sloping bank of snow, the lowest point being at the door, which has been formed by the trench running into the building. Therefore, when the builder is coming down with a course of blocks on the left side, they are peculiarly prone to tumble in. The fact that this side is used for starting up on the

spiral course, as already explained, assists somewhat to overcome this; but it is mostly remedied by the builder, as each round is made, trimming down the up-hill part of the course to about half, until, by the time the blocks are leaning considerably, the course is level (leaving out the spiral inclination).

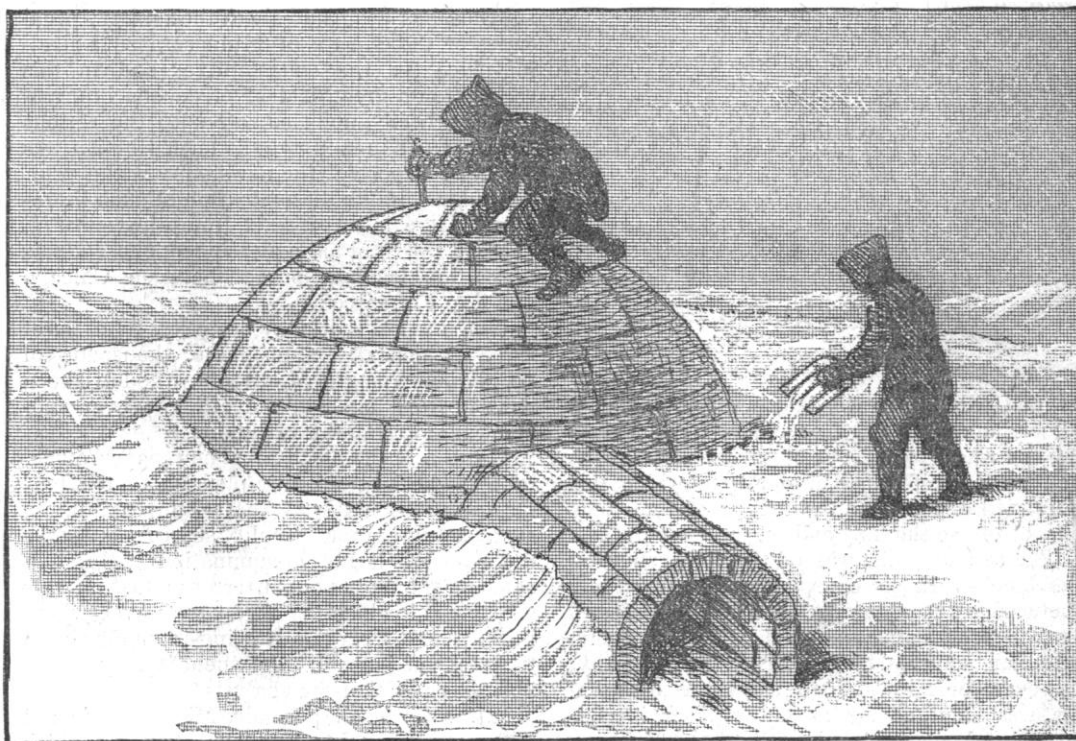
As each block is being fitted, it is held near its intended position by the left hand of the builder, who at one stroke cuts off the triangle on the right edge, giving a trapezoidal form. The left edge of the preceding block receives the same treatment, and the block is shoved into place. The snow-knife is rapidly passed backwards and forwards in the joints at the side and bottom, cutting off all inequalities, and making a fine powdery snow, which acts as a binding mortar. The last act is to give the block a sharp shoving blow with the open hand from the top, and another from the left side, which firmly sets it in place. The blocks all laid, the igloo is now complete, except the 'chinking' of the joints to render it air-tight, there being many large crevices. The chinking of an igloo is a very ingenious affair; the material being cut diagonally from the

lower edge of the upper block on the horizontal joints, and from the left edge of the right block on the vertical ones, if the person be



VERTICAL CROSS-SECTION THROUGH WALL OF IGLOO.

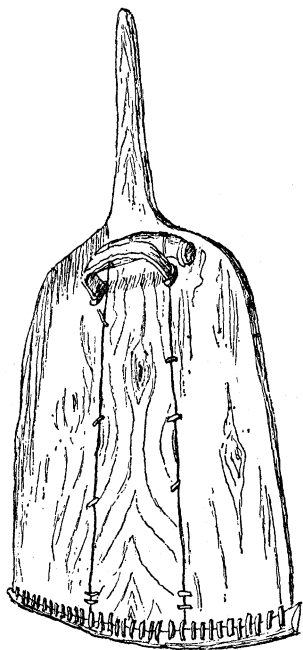
right-handed. As the knife in the right hand thus trims the edges, the left fist, tightly clinched, follows the knife, and rams the cut portion tightly into the crevice, rendering it



THE FINISHING TOUCHES.

as perfectly air-tight as the body of the snow-block itself. An active Innuït will go completely around the igloo on a single joint in about a minute, and it seldom takes over ten to do all the chinking in a large hut. This part is generally assigned to the boys and women, especially the former, who are much lighter, as it is necessary to go on top to complete their work. A well-built igloo, however, will readily bear the weight of two large men on their hands and knees; and yet I have seen a small boy fall through one made of friable snow.

Meanwhile the boys and women have been busy throwing the loose snow from the trench-



THE SNOW-SHOVEL.

es, and piling it on the house, often following closely upon the work of block-laying, covering the whole to a depth of from six inches to half as many feet. The depth to which this is carried depends on the length of time they expect to use the hut, and on the temperature.

The common pictures of the huts, showing the block-work so conspicuously, are largely the work of the imagination of the artists, all that is seen being rounded heaps of rough granular snow. Such artistic license may, however, be allowable to show the essential features; and, so far as my criticism is concerned, I do not wish to be understood as saying that such uncovered igloos never occur.

I have spoken of the snow-walls, when chinked, as being perfectly air-tight. This is not strictly correct; the snow being more or less porous, and allowing a slow but ample current of air to pass through. In fact, at night the door is sealed, and the only means of ventilation is through the body of the snow.

In 1879, during a heavy north-east gale, I was in an igloo on the west bank of Back's River. The walls were of a granular snow, but were covered to a depth of three or four feet. Yet, with all this thickness, a candle-flame held near the wall on the windward side was deflected constantly at an angle of from thirty to thirty-five degrees from the vertical.

The banking is done with a snow-shovel made of half-inch boards, tapering off to a short handle for one hand: a bent piece of musk-ox horn fastened in at the centre furnishes a hold for the other. The cutting edge is protected by a sharpened shoe of reindeer-horn, neatly bound on with reindeer sinew, which is also used to sew the boards together. The Netschilluks use shovels of cedar, walnut, and mahogany from Franklin's ships.

(To be continued.)

MINNESOTA WEATHER.

MUCH has been said about the sanitary properties of the climate of Minnesota as a healing-place for the consumptive; and in this connection a great deal of erroneous information has been published, often to the serious injury of the invalid, who is misled by it. As might be expected, the newspaper is the principal agent in the dissemination of such literature. Here is an extract from the editorial page of the St. Paul and Minneapolis *Pioneer press*, the leading journal between Chicago and San Francisco:—

“Of the aid that may be given by a pure, rarefied, and dry atmosphere, thousands of people now living in Minnesota, who have been rescued from impending death, can bear substantial and grateful testimony.”

Written in the haste of a newspaper office, by one who is practically pledged to the laudation of his state, as the western editor is, such a paragraph would scarcely deserve notice, were it not a summation in brief of some of the most popular errors afloat on this subject, and which one meets with everywhere in that land, from the drawing-room gossip to the medical journal. As such, it may profitably serve as text for analysis.

In the matter of pure air, Minnesota is not different from other northern states in which the face of nature has been moiled by the