FACTS ABOUT WATER.

IF a piece of ice, at a temperature below the melting point, be heated, it will rise in temperature and increase in volume according to the general law. This goes on until the melting point (32°) is reached, when both increase in volume and temperature suddenly stop. If ice, however, be subjected to pressure it has been demonstrated that its melting point is below 32°, a fact made use of in explaining the motion of glaciers.

The next effect of the heat is to melt the ice; the volume of water thus produced is about one-tenth less than that of the ice, while the temperature is the same. It follows, then, that water expands one-ninth in volume in passing into the solid state, and it does so with almost irresistible force, bursting asunder the containing vessel, whether it be a frail water pitcher or a solid rock. As the ice has a greater volume than the water from which it is immediately formed it must be lighter bulk for bulk, and, therefore, floats, forming a protecting surface for the denizens of the deep.

Suppose a block of ice at the melting point placed in a small room, also at 32°, and surrounded by an absolute non-conductor of heat. In this room, under those conditions, the ice would not melt. Next suppose just enough heat introduced to melt the ice and no more. The room then is warmer, while the ice is the same. Slowly the heat disappears from the room, and as slowly the ice changes into water. In time all the extra heat disappears and the ice is entirely converted into water. What has become of the extra heat? It could not have escaped from the room, as we supposed it surrounded by a perfect non-conductor, and the room and the water each register 32°. The conclusion is, it must have served to melt the ice and then hid itself in the water. Now let us see if we can make it "materialize" again. Suppose as much heat now extracted from the room as was previously introduced, both the water and the room are lowered in temperature, although there is evidently the same amount of heat as there was first; soon the water, especially if slightly agitated, begins to freeze. It rises rapidly to 32°, and as the freezing continues the room also rises to 32°. Thus the water has been forced to part with its hidden or *latent* heat, and with it, its very existence in the liquid form. The latent heat has been made sensible, for it has raised the temperature of the room. Thus water has in it latent heat which, as it were, is its life's blood, for it cannot give it up and exist. The amount of this heat required to change a given weight of ice at o° C to water at o° C would if applied to the same weight of water at o° C raise its temperature to about 79° C.

As soon as ice is melted the heat then applied raises its temperature, but very slowly. If a pound of water and a pound of copper were placed on a hot stove, it would be seen that when the copper becomes too hot to handle the hand might easily be held in the water, although each has absorbed the same quantity of heat. If a piece of copper and an equal weight of silver were placed on a hot stove we should observe, 1st, they could not become hotter than the stove; 2nd, while absorbing heat they would do so at the same rate; 3rd, when they became as hot as the stove they would not absorb any more heat; 4th that silver would reach the maximum temperature much the sooner. The copper then would go on absorbing heat after the silver had stopped, and when it reached the temperature of the stove it is clear that it would contain much more heat than the silver, and if wrapped up in a cloth and applied to a person's feet it would keep them warm for a longer time. Thus copper has a greater capacity for heat than silver; and water is a greater absorber of heat than any other substance. Thus large bodies of water serve to equalize the temperature of summer and winter. They are vast storehouses in which the superflous heat of summer is laid up as fuel for winter.—G. A.

(TO BE CONTINUED)

A WINTER IDYLL.

The snow comes falling, falling,
On the housetops o'er the way,
And I hear my mother calling,
Calling at the break of day.

"Mabel! Mabel! hurry! hurry!"
Is the oft repeated cry;
Then I make a scurry, scurry,
With a weary, weary sigh.

Quickly do I don my clothes,
And descend the breakneck stair,
To find, alas! that I am late
For breakfast, very rare!!

M. B.

NIGHT.

O spirit of night,
Of loving mother night.
I see thee now in robes of grey and dusky light
Stealing across the slopes of yonder hills,
Now hiding in cliffs where bide the silver rills,
And now with star-specked garments all aglow,
Trailing with undulating step and slow,
Thy glimmering train along the sleepy river.
Come, O come to me as I am sick at heart;
I feel coming o'er me a creeping shiver.
O come to me with all thy nursing art,
And bring the balm thy tenderness distils
For life's multitudinous ills.

Dryden, in his Æneid, no doubt had "Shorty," the brave driver of our patrol wagon, in his eye, when he wrote :—

"Their fury falls; he skims the liquid plains,
High on his chariot, and with loosened reins,
Majestic moves along, and awful peace maintains."