college is made; the English high school, where more attention is given to English and the modern languages; and the Mechanics Arts high school where instruction is given in manual training for two hours a day, the remaining period being devoted to English, mathematics and drawing, an education fitting the pupils for entrance into the advanced technical schools, or for engineering, mining, or any of the industrial pursuits. Two hours spent in the various departments of the Mechanics Arts school, in which were nearly a thousand boys, gave me many proofs of the inestimable advantage that it gives to a boy of a mechanical turn, and indeed to all active boys whose restlessness and ingenuity are turned to good account in alternating manual training with their studies in language and mathematics. The value of such a course as a discipline for the professions or the industries of life is clear. Boys are induced to remain longer at school, take a greater interest in their work while there, and go forth to the business of life with a far better preparation than those whose attention is exclusively given to books while at school.

Is the question of the value of manual training in schools settled? Undoubtedly it is; and those places that have not incorporated it into the work of the schools are, educationally, behind. We have excellent school systems in the Atlantic provinces, but so long as we fail to grasp the importance of manual training as a part of our educational equipment, or are too conservative and apathetic not to realize the advantages that it would give to public-school education, just so long will we remain behind.

It is a great pleasure to return my thanks to Mr. S. A. Wetmore, a former member of the Boston school committee, for his untiring attention and courtesy, and whose knowledge of the schools gave me special opportunities to find out much that I wished to know; and also to Supt. Seaver, who placed his valuable time freely at my disposal.

G. U. Hay.

NATURE STUDY.

A Talk About Water-Drops.

By Prof. A. Wilmer Duff.

(Concluded).

But we have not answered the question, "What is snow?" Snow-flakes are not frozen water-drops, for if they were they would be round like water-drops. They consist of particles of water vapor which have been caught and fixed in position by some invisible power before they united to form water-drops. This power is not merely the coldness of the air, for that could not give the snow flakes their regular shape. The star-making power is something more than mere cold, or even the cohesion which we spoke of before, but we shall not at the present time attempt to explain it. If you wish to find the effect of great cold alone on water vapor, fill a tumbler with a mixture of salt and snow and observe how the vapor particles from the air are deposited on the outside, owing to the intense cold produced by the freezing mixture. What you get here is much like the hoarfrost that takes the place of dew on very cold nights, and, in fact, hoarfrost is merely frozen vapor which did not become liquid before freezing.

Perhaps you are somewhat surprised at the statement that vapor can turn into a kind of ice, such as snow or hoarfrost, without first becoming liquid water. Yet there is no doubt about it, and it is no more surprising than the other fact that snow or ice can turn into vapor without first becoming water. For instance, when there is very cold weather for two or three days together, it is often found that the snow disappears, although the weather is quite too cold for it to melt. It has simply flown away particle by particle as vapor. You may have to wait a good while before you get a chance to observe this, but there is another way of observing the same thing. The next time that clothes are put out to dry on a very cold day notice that the clothes can dry almost completely although it was certainly too cold for the ice on them to melt into water. You may say that it has melted into vapor.

Although snow does not consist of frozen water-drops, yet we are all familiar with frozen water-drops under the name of hail. These little ice balls come down sometimes in summer when the air does not seem cold enough to freeze water. But they must have been frozen somewhere before reaching the earth, and so we learn that there must be somewhere above us on a summer day places where the air is cold enough to produce ice. You can often see such a place, even on a hot summer day, if you wish. Look for a cloud that seems very high up, one that resembles hairs or feathers with their fibres curled. These clouds are sometimes called horse-tail clouds. They consist really of small pieces of ice instead of drops of water. When you see many of these clouds you may expect wind soon, or at least a change of weather. They are very high up, sometimes as much as ten miles. You must not, however, suppose that the hail actually comes from these clouds. It really is formed much nearer the surface of the earth by very cold currents of air. If the drops are first frozen into hail by cold air, and these frozen drops before reaching the earth have to pass through a thick layer of warm air, they are partly melted again, and we get what is called *sleet*.

We have said a good deal about water vapor shrinking as it is cooled until it becomes drops of water. What happens to water as it is cooled? Does it shrink? Try it for yourself in this way: Take a large glass bottle with a narrow neck. Fill it first with pretty warm water, merely to warm it up. Then pour this out and fill it with water that is nearly boiling. Tie a string around the neck just where the water stands, cork the bottle and put it where it can cool. Look at it as it cools, and notice that the level of the water falls steadily.

We thus see that water shrinks as it cools. Notice which part of the bottle is the colder, and see if you can