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Ririro

IMAGINATION OVER KNOWLEDGE

Electricity

Jules gave a lengthy account of the day to his brother and sister. At the part relating to the thunderbolt Claire trembled like a leaf. "I would have died of fright," said she, "if I had seen the lightning strike the pine." After the deeper emotion came curiosity, and they all agreed to beg their uncle for a talk on the subject of thunder. And so the next day Jules, Emile, and Claire gathered around their Uncle Paul to hear him tell them all about it. Jules broached the subject.

"Now that I am no longer afraid, will you please tell us, Uncle, why we should not take refuge under trees during a storm? Emile, I am sure, would like to know."

"I should first of all like to know what thunder is," said Emile.

"I too," said Claire. "When we know a little what thunder is, it will be much easier to understand the danger from trees."

"Quite right," commented their uncle, approvingly. "First let us see whether any one of you knows anything about thunder."

"When I was very small," Emile volunteered, "I used to think it was produced by rolling a large ball of iron made of resounding metal over the vault of the sky. If the vault broke anywhere, the ball was dashed to the ground and the thunder fell. But I don't believe that now. I am too big."

"Too big—a little fellow not so high as the first button on my vest! Say rather that your little reasoning powers are awakening and that the simple explanation of the iron ball no longer satisfies them."
Then Claire spoke. "I am not satisfied either with the explanations I used to give myself a while ago. With me, thunder was a wagon heavily loaded with old iron. It rolled on top of a sonorous vault. Sometimes a spark would flash out from under the wheels, the same as from a horse's hoof when it strikes a stone: that was the lightning. The vault was slippery and bordered with precipices. If the wagon happened to tip over, the load of old iron would fall to the ground, crushing people, trees, and houses. I laughed yesterday at my explanation, but I am no farther advanced now: I still know nothing at all about thunder."

"Your two thunders, varying to suit your infant imaginations, are based on the same idea, the idea of a sonorous vault. Well, know once for all that the blue vault of the sky is only an appearance due to the air which envelops us, and which, owing to the thickness of the envelope, has a beautiful blue color. Around us there is no vault, only a thick layer of air; and beyond that there is nothing for a vast distance until you come to the region of the stars."

"We will give up the blue vault," said Jules. "Emile, Claire, and I are persuaded there isn't any. Please go on."
"Go on? Here is where difficulty begins. Do you know, my children, that your questions are sometimes very embarrassing? 'Go on' is soon said; and, filled with unbounded faith in your Uncle Paul's knowledge, you expect an answer which, you feel sure, will satisfy your curiosity. You must, however, understand that there are innumerable things beyond your intelligence, and before you can grasp them you must attain to riper reason. With age and study many things will become clear that now are dark to you. In this number is the cause of thunder. I am very willing to tell you something about it; but if you do not understand all that I say you must blame your own premature curiosity. It is a difficult subject for you, very difficult."
"Only tell us about it," Jules persisted; "we will listen attentively."
"So be it. Air is not visible, one cannot take hold of it; if it were always at rest you would not, perhaps, suspect its existence. But when a violent wind bends tall poplars and scatters the leaves in eddies, when it uproots trees and carries off the roofs of buildings, who can doubt the existence of air? For wind is only air streaming irresistibly from place to place. Air, so subtle, so invisible, so peaceful in repose, is therefore in very truth a material substance, even a very brutal one when in violent motion. That is to say, a substance can exist, although at times nothing betrays its presence. We do not see it or touch it, are not sensible of it, and yet it is

there, all about us; we are surrounded by it, live in the midst of it.

"Well, there is something still more hidden than air, more invisible, more difficult to detect. It is everywhere, absolutely everywhere, even in us; but it keeps itself so quiet that until now you have never heard of it."

Emile, Claire, and Jules exchanged glances full of meaning, trying to guess what it could be that was found ever where and that they did not yet know of. They were a hundred leagues from guessing what their uncle meant.

"You might seek in vain by yourselves all day, all the year, perhaps all your life; you would not find it. The thing I am speaking of, you understand, is singularly well hidden; scholars had to make very delicate researches to learn anything about it. Let us make use of the means they have taught us to bring it to light."

Uncle Paul took from his desk a stick of sealing-wax and rubbed it rapidly over his cloth sleeve; then he put it near a small piece of paper. The children were all eyes. Behold, the paper flies up and sticks to the sealing-wax. The experiment is repeated several times. Each time the paper rises unaided, starts off, and fastens on to the stick.

"The piece of sealing-wax, which formerly did not attract the paper, now does. The rubbing on the cloth has, then, developed in it something that cannot be seen, for the stick has not changed in appearance; and this invisible thing is nevertheless very real, since it can lift up the paper, draw it to the wax, and hold it glued there. This thing is called electricity. You can easily

produce it by rubbing on cloth either a piece of glass or a stick of sulphur, resin, or sealing-wax. All these substances, when rubbed, will acquire the property of drawing to themselves very light objects, like small pieces of straw, little bits of paper, or particles of dust. This evening the cat shall teach us more about it, if it will be good."