

His father followed with the other end. Thus they advanced several steps along the side of the road.

"There," said his father. "Stop. That you see, was a *progressive motion*."

"Yes, sir," replied Rollo.

"The whole string advanced along the road," added his father. "It made progress, and so it was a *progressive motion*. Now, listen your end of the string, Rollo, to that tree directly behind you."

Rollo looked behind him, and saw that he was standing near a small maple-tree, which had been planted, a few years before, by the side of the road.

"Tie it right around the stem of the tree," said his father, "about as high as your shoulder."

Rollo fastened the string as his father had directed. Then his father fastened his end, in the same way, to another tree, which was growing near where he was standing.

"Now," said he, "there can be no more *progressive motion*, but there can be a *vibratory one*. Take hold of the string near where it is fastened to the tree."

Rollo took hold of it, as his father had directed, and then his father told him to shut his eyes. When his eyes were shut, so that he could not see, his father said that he was going to strike the string, at his end of it, with his pencil-case, and he asked Rollo to observe whether he could feel any motion.

Rollo held very still, while his father struck the string; and immediately afterwards he called out, "Yes, sir." Then his father struck the string again, several times, and every time Rollo could feel a distinct vibratory or quivering motion, which was transmitted very rapidly through the string, from one end to the other; although, as the string was fastened by both ends to the trees, it was evident that there could be no *progressive motion*.

Rollo's mother had been standing all this time at the step of the door, watching the progress of the experiment; and, when she saw the expression of satisfaction upon Rollo's countenance, while he was standing with his eyes shut, holding the end of the string, she wanted to come and take hold of it herself, so as to see what sort of a sensation the vibratory motion of the string produced.

So she came out through the gate, and asked Mr. Holiday to wait a moment while she went to where Rollo was standing and took hold of the string. But he said that it would not be necessary for her to go there, as she could take hold of his end of the line just as well, and let Rollo strike the other end.

They accordingly performed the experiment in that way, and Rollo's mother could feel the vibrations very distinctly.

"One thing you must observe," said Mr. Holiday; "and that is, that the vibrations pass along from one end of the line to the other very quick indeed. We feel them at one end almost at the same instant that the other end is struck."

"Exactly at the same instant, sir," said Rollo.

"No," replied his father, "not exactly at the same instant, though it is very nearly the same."

"I did not see any difference," said Rollo.

"No," replied his father, "you cannot perceive any difference in so short a string; but if we had a string, or a wire, a mile long, I presume that we should find that it would require a sensible period of time to transmit the vibrations from one end to the other."

"What do you mean by a sensible period of time, father?" asked Rollo.

"Why, a length of time that you could perceive," said his father; "just as it was with the man cutting wood. We could see that some time elapsed between the striking of the blow, and our hearing the sound."

"Yes," said Rollo, "just as long as it took him to lift up his axe."

"That is not certain," replied his father, "because the sound that we heard might have belonged to a blow made before. That is, it might be that, when he had struck one blow, he had time to raise his axe and strike another, and then raise his axe again, before the sound of the first blow came to us."

"Yes, sir," said Rollo, "I understand."

Mr. Holiday then told Rollo that he might unfasten the string from the trees, and wind it up again into a ball, and bring it in. Then he and Rollo's mother went into the house, to see if breakfast was not almost ready.

That morning, after they were all seated at the breakfast table, Rollo said to his father that he did not exactly understand what sort of a motion the vibratory motion of the air was after all.

"No," said his father, "I suppose you do not. And, in fact, I do not understand it very perfectly myself. I only know that the philosophers say, that, when a man strikes a blow with an axe upon a log of wood, it produces a little quivering motion of the air, which spreads all around, darting off in every direction very swiftly. If a boy strikes a tin pail with a drumstick, it makes another kind of quivering or vibration, which is different from that which is made by the axe; but I don't know precisely how it differs. So, when the air is full of sounds, on a still morning, it is full of these little vibrations, like a string which trembles from end to end, though its ends are fastened so that it cannot move away."

"Then the air is never at rest," said Rollo's mother.

"No; certainly not, when any sound is to be heard: and it is never perfectly silent."

"There is one thing very extraordinary," said Mrs. Holiday.

"What is it?" asked Rollo's father.

"Why, that, when a great many sounds are made at the same time," she replied,—"as, for example, when we are upon the top of a hill, on a still morning, and hear a great many separate sounds, as a man cutting wood, birds singing, a bell ringing, and perhaps a man shouting to his oxen,—all those tremblings or vibrations, being in the air together, do not interfere with one another."

"Yes," said Mr. Holiday, "it is very extraordinary indeed. They do not seem to interfere at all. When there are too many sounds, or if there is a wind with them, they do interfere; but, in a calm morning, like this, when the air is at rest, you can hear a great many distant sounds very distinctly."

"Yes," said Rollo, "and I mean to go up to the top of the rocks again after breakfast, and listen."

Filial Insubordination.

If I were called upon to say what I consider the distinguishing and "crying sin" of the present day, I should answer without the least hesitation or doubt, Filial Insubordination, the want of reverence for parents and parental authority. I know there is a proneness in some minds to institute comparisons between the former times and our own, unfavorable to the latter, which is justly rebuked by the wise man, but in the present case I think there can be no mistake. Never within my recollection, or the scope of my observation, has there been anything like the present absence of all control over children. Everywhere the evil states us in the face. The modesty, the docility, the quiet submission of childhood to rule is gone: childhood is vanished. We have no children. They are transformed into smaller men and women, with all the confidence and assurance of those accustomed to command and lead, to ordain and direct.

It may not be easy to assign all the causes which have operated to produce this deterioration in juvenile morals, but one cause I have no doubt is modern, popular but false and pernicious doctrine that children should be governed by reason, not by authority. If a parent wish a child to do a thing, instead of telling him to do it, he must inquire in a very meek and quiet manner whether the child does not think he had better do it. "My dear, do you not see how reasonable it is, how much it will promote your present interest, how much happiness you will feel, and how much it will contribute to your future welfare and respectability, if you should do as I request?" An old-fashioned father would have said, "John do it,"—and it would be done. The modern mode proceeds upon the supposition that the great want of the child is an uninformed judgment, which is not true. The old mode went upon the principle that the child needed a spirit of reverence and submission to lawful authority, and the old mode was right. We do not want the child's judgment in the case at all. It is the parents' business to judge whether John had better do a given thing or not. God has appointed the parent to that duty, and it is as wrong as it is foolish and impracticable to devolve it back upon the child. And yet this is the modern and grand improvement in juvenile education. No wonder the world is getting turned upside down, and children are usurping the prerogatives of the parent.

Allow me to suggest as another reason for the prevailing irreverence of children, their frequent appearance and performances in public exhibition of Sunday schools, concerts, &c. It has always appeared to me indiscreet to permit their participation in exercises which minister so promptly to their self-importance and self-complacency. Any one who has taken discriminating notice of children on such occasions, especially at concerts, must have